MC0072

HEALTH BUILDING NOTE 10

Catering Department

DEPARTMENT OF HEALTH AND SOCIAL SECURITY
and the WELSH OFFICE

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Health Building Notes

Health Building Notes (HBNs) are intended to assist those involved in the briefing and design stages of schemes to provide new health buildings or to adapt or extend existing premises. The Notes contain information on relevant aspects of service objectives, functional requirements, and design. They establish standards of accommodation that are consistent with the functional requirements and form the basis for deriving Cost Allowances.

The functions, activities, equipment, environmental conditions, engineering services, and dimensions which are critical to the efficient performance of an activity, are identified and discussed but no preference for any particular configuration or plan is implied. Optional solutions with cost implications are indicated, where appropriate, leaving local planners to make their own choices.

Reference is made in the Notes to the related Design Briefing System and also to Activity Data sheets which provide the detailed user requirements for each room or space.

Guidance on spaces common to all health buildings has been brought together in HBN 40* 'Common Activity Spaces' to which reference is made where appropriate in each Note.

HBNs are prepared in consultation with representatives of the National Health Service and appropriate professional bodies.

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*HBN 40 — Volume 1 — Clinical, Sanitary, Administrative and associated spaces
Volume 2 — Corridors
Volume 3 — Lifts and Stairways } in preparation
Volume 4 — Designing for Disabled People }

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1 General

1.1 This Health Building Note (HBN) provides guidance for Health Service catering and replaces Hospital Building Note 10 'Kitchens' issued in March 1961, reprinted with amendments 1965, and Hospital Building Note 11, 'Dining Rooms' issued in February 1961. This guidance is concerned with the design and equipping of conventional catering departments serving 400–1500 meals which use fresh and convenience foods. Cost allowances are given for 600 and 1200 meals, and for 600 meals as a first phase where expansion to 1200 is envisaged; a margin of 100 meals above or below these functional units is not expected to significantly affect these allowances. For sizes of department outside these limits the functions may be basically the same as those described in this Note but the scale of operation and consequently the requirements will differ (5.6). When considering the content of the catering department, project teams should take into account the need for specialist catering advice and for early consultation with the various staff interest, eg medical, nursing, trades unions, particularly in relation to the provision of restaurant facilities.

1.2 In recent years there have been many changes in catering procedures and in the eating habits of patients and staff. A wide choice of dishes at each meal is now offered to staff and since the introduction of a pay as you eat system (HM 67/10) there is less demand for three course meals, breakfast and supper meals, but a considerable increase in call-order and snack meals.

1.3 Catering premises are expected to conform to the requirements of the Department's circular HC(77)24, (WHC(77)29 in Wales) issued in July 1977, concerning the need for local environmental health officers to be given open access to catering departments. Health and Safety at Work legislation requires designers and planners to provide a safe and healthy working environment.

1.4 In catering departments account should be taken of the need for economy in provision, running costs and energy consumption, whilst retaining sufficient flexibility to enable an emergency service to be provided in the event of the loss or restriction of any one of the primary energy sources (gas, electricity, steam etc).

Upgrading or adaptation of existing buildings

1.5 The standards set out in this guidance apply to the provision of accommodation by new building and it is not intended that they should be applied retrospectively to existing stock. However, the principles are equally valid and should be applied, so far as is reasonably practicable, when existing accommodation is being upgraded or new accommodation is being constructed within an existing building, which may previously have been used for other purposes. In such cases the aim should be to meet building note standards whenever possible although it is recognised that compromises will inevitably have to be made. Upgradings must conform to current fire safety and other statutory regulations.

1.6 The cost of upgrading work should conform to the guidelines indicated in the Department's WKO letter (81)4, (AWO(81)8 in Wales) issued to hospital authorities on 24 July 1981. These guidelines take into consideration the estimated life of the existing building and the difference in cost between upgrading a building and new building.

1.7 When comparing the cost of upgrading or adapting an existing building to that of new building, in addition to the building cost due allowance must be made for the cost of relocating people, demolition and salvage costs, disruption of services in a phased project, and the temporary effects on running costs of any impaired functioning of areas affected by upgrading.

Inclusions

1.8 This Note includes the following facilities:

a. goods reception and storage

b. food preparation and cooking

c. patients' tray preparation

d. trolley loading, unloading and washing

e. central wash-up

f. servery

g. staff restaurant, coffee lounge, call-order bar and vending machines

h. offices, staff rooms and ancillary accommodation.

Exclusions

1.9 This Note does not give guidance on:

a. hospital bakeries—many of these have closed because it may no longer be economical or practicable for hospitals to produce their own bread

b. hospital butcheries—although there are several centralised butcheries supplying groups of hospitals throughout the country, it is considered that with the greater availability of commercially produced oven-ready joints and portioned meats these butcheries may not be so economical in the future

c. ward pantry (see Common Activity Spaces HBN Volume 1)

d. central beverage preparation facilities

e. patients' cafeteria service (1.28)

f. satellite or peripheral finishing kitchens (1.29)

g. snack bars in out-patient departments

h. accommodation related to the dietetic service—the dietetic involvement with the catering service is mainly in menu planning, in-service training and instruction of cooks in the diet bay. Office accommodation near the catering department is therefore not essential

i. dining facilities in residential accommodation and accommodation for postgraduate medical education

j. dining facilities in smaller hospitals—approx 100 meals

k. the cook/freeze and cook/chill systems of production which demand special attention and specialised equipment. Information about these systems will be issued in due course as a supplement to this Note.

Purpose

1.10 The aim of the hospital catering department is the production and service of nutritious and palatable meals to patients and staff. The achievement of this aim with maximum efficiency and economy is dependent on many factors, of which perhaps the most important is the design of the building; the provision of suitable and efficient equipment, and the organisation and management. These factors are closely related, for design and equipment may determine the staffing required and the method of organisation. In planning these services account should be taken of the need to provide:

a. hygienic food handling facilities

b. food storage in suitable and secure accommodation

c. support, where appropriate, for the ward staff in food distribution and washing-up

d. a safe, healthy and congenial working environment for staff

e. suitable facilities for staff training.

Energy conservation

1.11 Loss of energy arises from the conversion of fuel to heat and from the loss of heat from equipment. Other factors are the partial loading of equipment and leaving equipment running when not in use. A current DHSS low energy research programme should lead to more specific guidance on this subject. Recommendations may include measures to insulate cooking and servery equipment against avoidable heat loss, to localise the extraction of steam and smells, and to install time switches and meters.

Workload

1.12 To determine the size of the kitchen it is necessary to estimate how many meals will be required by patients and staff at the lunch time peak period. The number of patients' meals is related to the number of occupied beds in the hospital, but the number of staff meals is a more complicated calculation depending upon more variable local factors. However, these factors must be considered and an estimate made of the number of staff meals. When added to the number of patients' meals this provides the workload for the kitchen. The figure for patients' meals is related to the number of beds, however, bed occupancy can vary from 70% to 85% (higher occupancies are rarely achieved). Unless the average occupancy is known, 80% to 85% may be assumed.

1.13 The size of the staff dining room and its servery is related to the number of staff requiring a meal at the peak period (usually lunch time). This must be determined locally and will depend upon factors such as the location of the hospital and alternative dining facilities on or near the hospital site eg postgraduate medical centres, pubs, restaurants, staff association clubs etc. The number of staff on night duty should be excluded from estimates since meals are served at off-peak periods. A reduction should be made for staff on leave, sick or absent from the hospital and will not therefore require meals. For every three staff mid-day meals one dining space is required. This allows each seat to be used three times over the mid-day lunch period. In larger hospitals up to four sittings may be possible but it may not be possible to achieve similar levels of utilisation in smaller hospitals. The number of seats in the coffee lounge should be approximately equal to that in the staff dining room but this estimate should take account of the proportion of numbers dining who will take coffee and numbers taking coffee who do not use the dining room. A step by step method is described in Appendix 3 for estimating seating provision in dining rooms and coffee lounges and thus for estimating the size of the kitchen to provide this service in addition to patients' meals.

Food purchase, storage and distribution

1.14 Since HBN's 10 and 11 were issued in 1961 (1.1), there have been changes in food purchasing policies for health service catering which may influence planning and design.

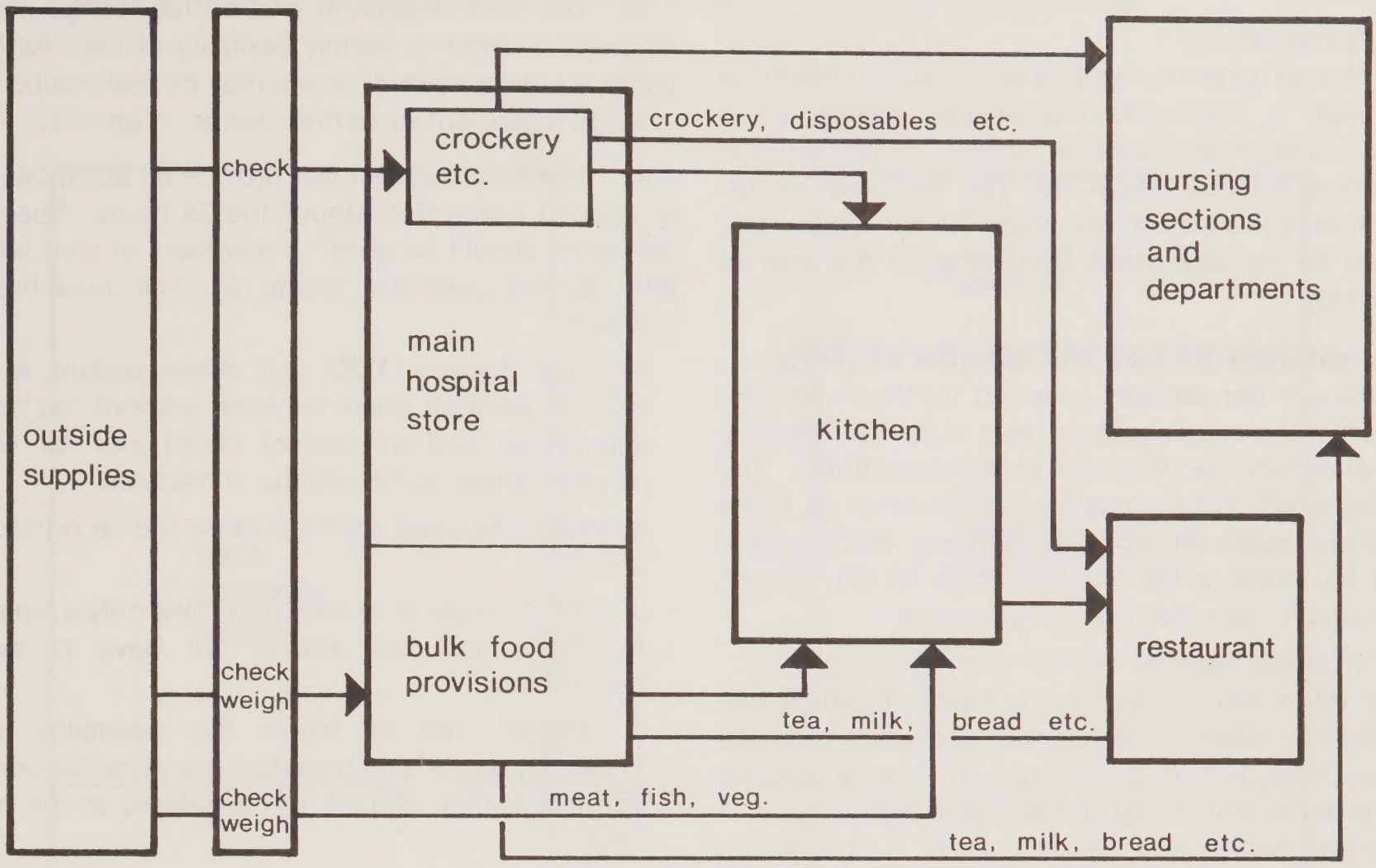
1.15 The use of pre-prepared vegetables, whether from outside suppliers or a central preparation area, may reduce the staff and space needed for preparation, although there is a corresponding increase in cooled storage requirements. It is not desirable to eliminate all fresh vegetable preparing equipment in case the supply of pre-prepared vegetables fails.

1.16 The amount of fresh vegetables used has gradually diminished and has been replaced mainly by canned and frozen items. Frozen foods are comparatively expensive but may be justified by the savings in labour costs. The quantities of frozen foods now used require increased deep-freeze storage. Cooled storage will be required for fresh fruit and salad items.

1.17 The use of pre-portioned foods and pre-mixes, such as soup powder, pastry and sponge mixes etc, reduces preparation and labour time but requires additional storage space. The same preparation and cooking equipment is used as for conventional foods.

1.18 The respective roles of the main supplies organisation and the catering department need to be clearly defined and co-ordinated at the earliest possible stage. Where local policies envisage an expansion of bulk purchasing, eg frozen foods, extra storage accommodation must be considered; the cost of providing this accommodation may be offset by purchasing savings over a period of time. By consultation with the appropriate supplies organisation, the services required by the catering department may be clearly assessed and provided. Delivery timetables, distribution and collection systems need to be inte-

Figure I Supply and distribution of catering provision



grated as far as possible with the arrangements for other hospital departments. As both a user and provider of services, the catering department should be integrated into the general pattern of supply and distribution within the hospital.

1.19 Where possible supplies should be centrally organised. Information on the planning of central stores is contained in the DHSS Supply Division booklet 'A guide to planning central stores', third revision—November 1979. Where the central stores is not on the same site as the hospital a bulk provisions store will be needed the size of which will depend on the frequency of deliveries agreed with the appropriate supplies organisation. Limited storage facilities for food will be needed in wards. The requisitioning and replenishment of cutlery and crockery in wards and other hospital departments should be in accordance with local policy.

Patients' meals service

1.20 This Note is concerned mainly with a centralised kitchen and wash-up. The service of meals to patients should be so planned that they can choose the dishes they require for each meal from an individual menu which includes special diets. This requirement is met by a central tray service (3.53) which is now in use in hospitals and is the preferred method for most wards where it can be justified by the number of meals to be supplied. However some wards and day hospitals may still require a bulk trolley service. (3.61)

1.21 The centrally plated meal service (3.60) is an alternative service which provides a choice of dishes, but adopts a different method of keeping meals hot. The plated main course is transported by an electrically-heated trolley to the wards where tray loading is completed.

1.22 The bulk trolley service (3.61) is another alternative method which has been used by hospitals for many years. The plating of the meal may take place in the ward or in a day hospital cafeteria. Bulk trolleys would be loaded in the central kitchen where parking space and power supply for the heated trolleys will be required. However, bulk delivery can lead to a high proportion of wasted food owing to the lack of central catering control and limited choice of dishes; it is therefore being replaced where appropriate by a central tray service.

Meals service in wards

1.23 Meals may be delivered to wards by a central tray or centrally plated meals service or by bulk trolley service.

Ward pantry

1.24 a. The pantry described in the 'Common Activity Spaces' health building note is suitable for use in conjunction with a central tray service where trays and contents are returned direct to the central wash-up

b. other types of service, eg bulk trolley service, will demand more space for the assembling of trays. If items are not returned to the central wash-up, additional space will be needed for a small commercial dish-washing machine and storage cupboards for crockery and cutlery etc. The consequences of designing and equipping a ward pantry will need to be taken into account.

Patients' beverage service

1.25 Centralised beverage preparation for patients is not recommended because of the repeated movement of

crockery etc and the manpower implications. This Note therefore assumes that all the beverages for patients throughout the day will be prepared in the ward pantry where beverage preparation can be readily suited to patients' needs.

Disposable tray service

1.26 Wherever patients need to be isolated (infectious patients etc), a disposable tray service system offers obvious advantages and could be adopted. It may serve as an occasional standby elsewhere. The high cost of disposables makes this service uneconomical for regular use, but it may be partially offset by savings in the cost of dish-washing.

Patients' cafeteria service and satellite kitchens

1.27 Although the services provided by these facilities are not part of the catering department (1.8, 1.9) they may have an effect on the workload of the department. The paragraphs which follow may be of assistance to those who have to provide either of these services. Further guidance will be found in the building notes for the departments in which these services are provided.

Patients' cafeteria service

1.28 For day hospitals the various types of patient disabilities must be taken into account before deciding on the most appropriate type of meal service. Where the majority of patients are ambulant, eg in psychiatric departments, a cafeteria-type service may be considered. The cafeteria service counter comprises heated, refrigerated and ambient temperature sections and beverage-making equipment. There may also be some 'back-bar' cooking equipment, but food which takes a relatively long time to cook would be supplied from the central kitchen and delivered in insulated heated food trolleys or plastic insulated boxes. Separate washing-up facilities may be required if a unit is remote from the central wash-up.

Satellite kitchens

1.29 In certain circumstances the service from the central kitchen may have to be supplemented by satellite or peripheral finishing kitchens. These satellite kitchens are separate cooking areas which may be used where the direct distribution of meals from the central kitchen is impracticable because of distance or lack of capacity. They may also be suitable for supplying departments such as training schools, accommodation for postgraduate medical education and research laboratories. A satellite kitchen receives supplies from the central kitchen and is equipped with finishing cooking equipment, eg fryers, grills, high-speed steamers and microwave ovens. Certain foods which need a long time to cook, eg roasts, may be delivered from the central kitchen in insulated heated food-trolleys. A satellite kitchen can often be combined with a cafeteria counter but for in-patients a localised type of tray service may be more suitable. The running costs of such a service must be taken into account.

Staff meals service

1.30 To create a pleasant atmosphere the staff restaurant and lounge areas need to be attractively lit, decorated and furnished. Floors should be carpeted. The choice of furniture, fittings, crockery and staff uniforms are equally important. The staff restaurant, including the call-order bar and coffee room, should be sited as centrally as possible so that staff do not have a long walk from their departments. It should be located close to the central kitchen. Hospital staff need meals throughout the 24 hours. (1.32) Toilet facilities may be provided.

1.31 The staff restaurant and coffee lounge should be adjacent in order to permit flexibility of use. As demand varies the proportion of space may be reallocated accordingly to restaurant or coffee lounge. (Figure 2)

1.32 The restaurant should provide an acceptable range of cooked meals throughout the 24 hours. Special consideration should be given to members of staff who have little control over the timing of their meal-break; for instance:

a. junior doctors (1.35) and others seeking a cooked meal in the short break between sessions (eg operating department and out-patient clinic) and for whom a priority service-point may be considered

b. staff who need meals outside the recognised meal period

c. staff on night duty who may have only a limited time for their meal and should not have to await its preparation

d. 'on-call' staff for whom the availability of other meals, eg supper and breakfast in a place convenient for informal eating, should be considered at the planning stage

e. staff who are unable to leave the department (eg operating) for a meal.

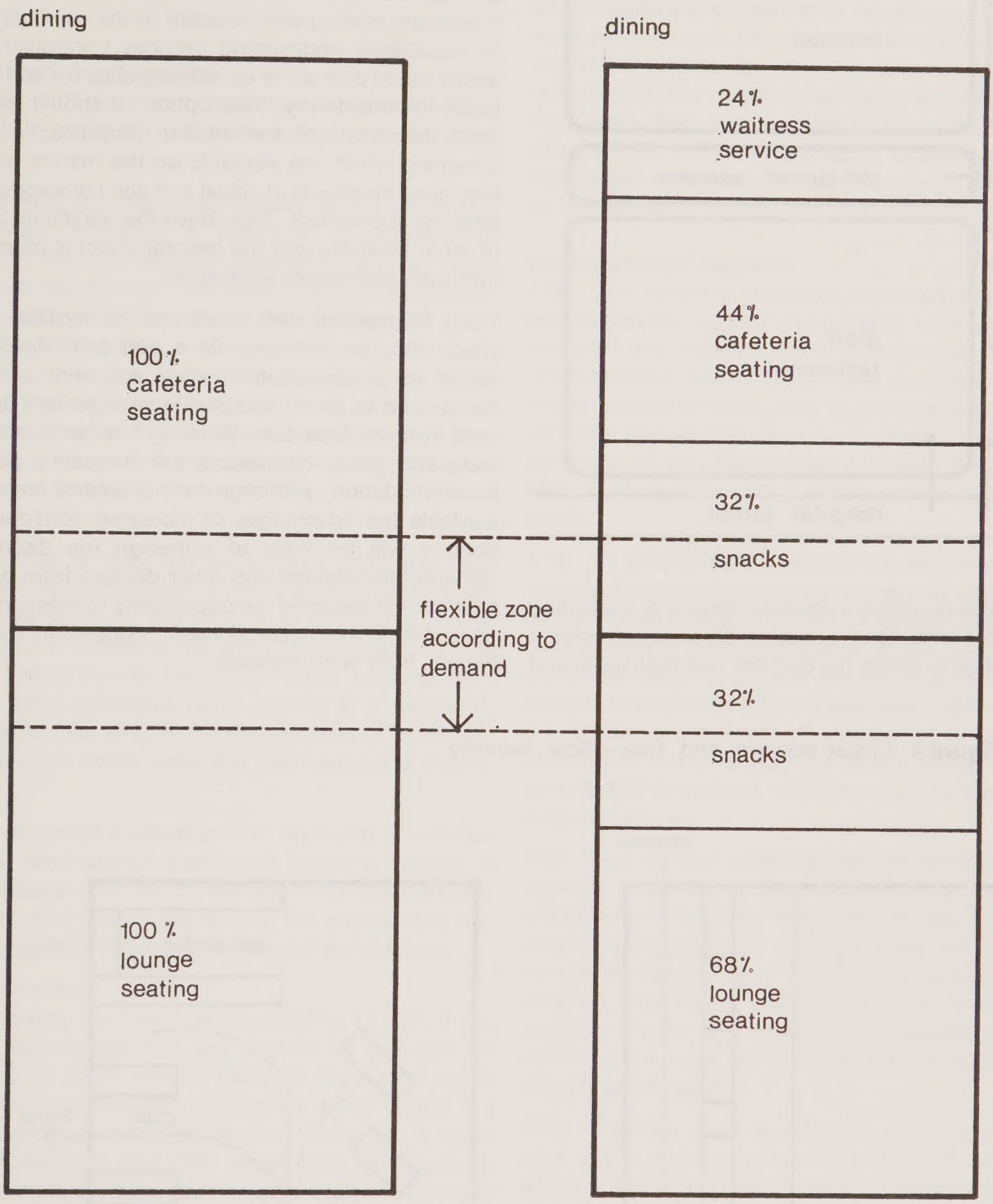
1.33 For staff requiring a meal during the night consideration should be given in the interests of energy conservation to providing the call-order bar and its associated seating area with artificial lighting and ventilation that can be controlled independently from the rest of the restaurant. This area could also serve a dual function by providing an area of separate seating during the day for the purposes of privacy or for other reasons.

1.34 Other hospital departments may contain facilities eg rest-rooms and staff social clubs and this could affect the number of staff using the restaurant. There should also be a snack bar in or near the out-patient department, intended primarily for patients and visitors.

1.35 Catering arrangements for medical staff require careful consideration, particularly for resident staff who work long hours and for whom the hospital, during their long term of residence, is effectively their home. As mentioned in paragraph 1.32, consideration should be given to the provision of a priority service point and it is essential that they should be able to obtain a good meal outside of recognised meal times and during the night. For non-resident staff who mainly comprise consultants and the more senior doctors in training the arrangements for serving lunches are the most important. Occasional meals or snacks must however be available for them too at other times, particularly at night or at weekends if they are called in for emergency duties.

1.36 The way in which the service is provided will be a matter for local decision. For example, local circumstances may call for the inclusion of a separate dining room for resident medical staff. This should be done in a way that

Figure 2 Alternative allocation of seating in dining room and coffee lounge



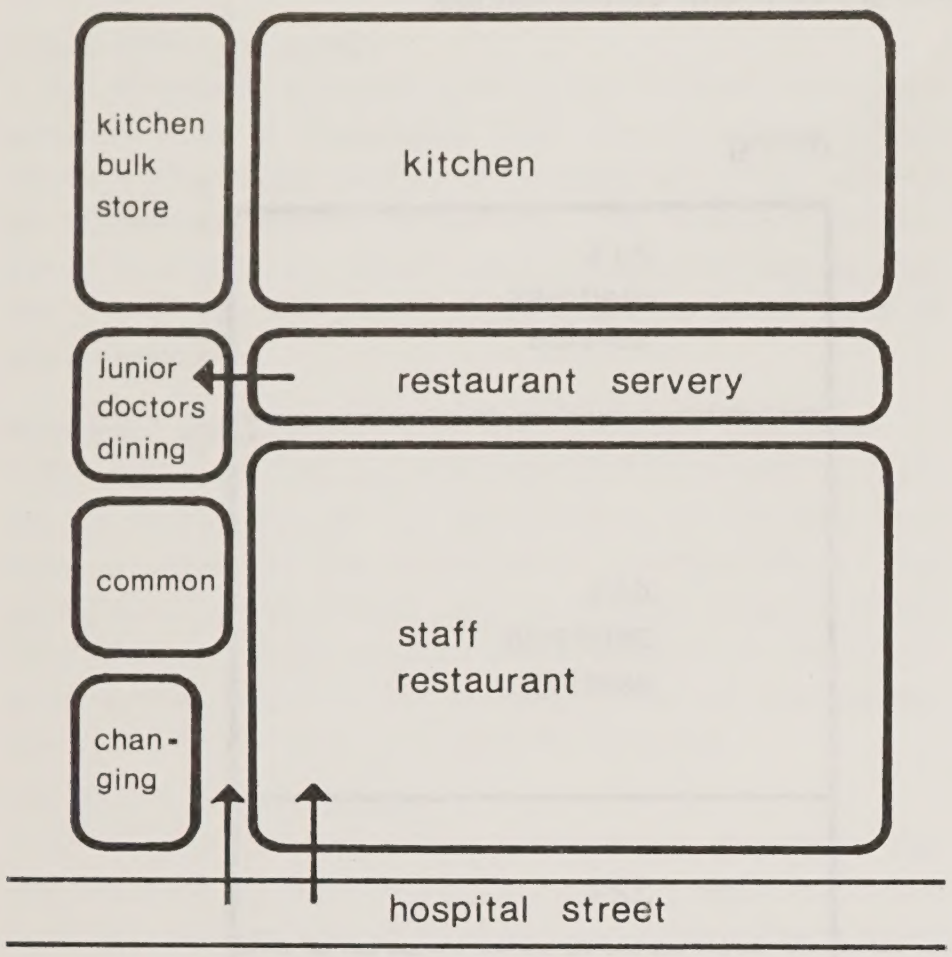
total area of dining allocated to cafeteria seating

total area of coffee lounge allocated to lounge seating

dining area allocated to waitress service, cafeteria and snacks.

coffee area allocated to lounge seating and snacks

Figure 3

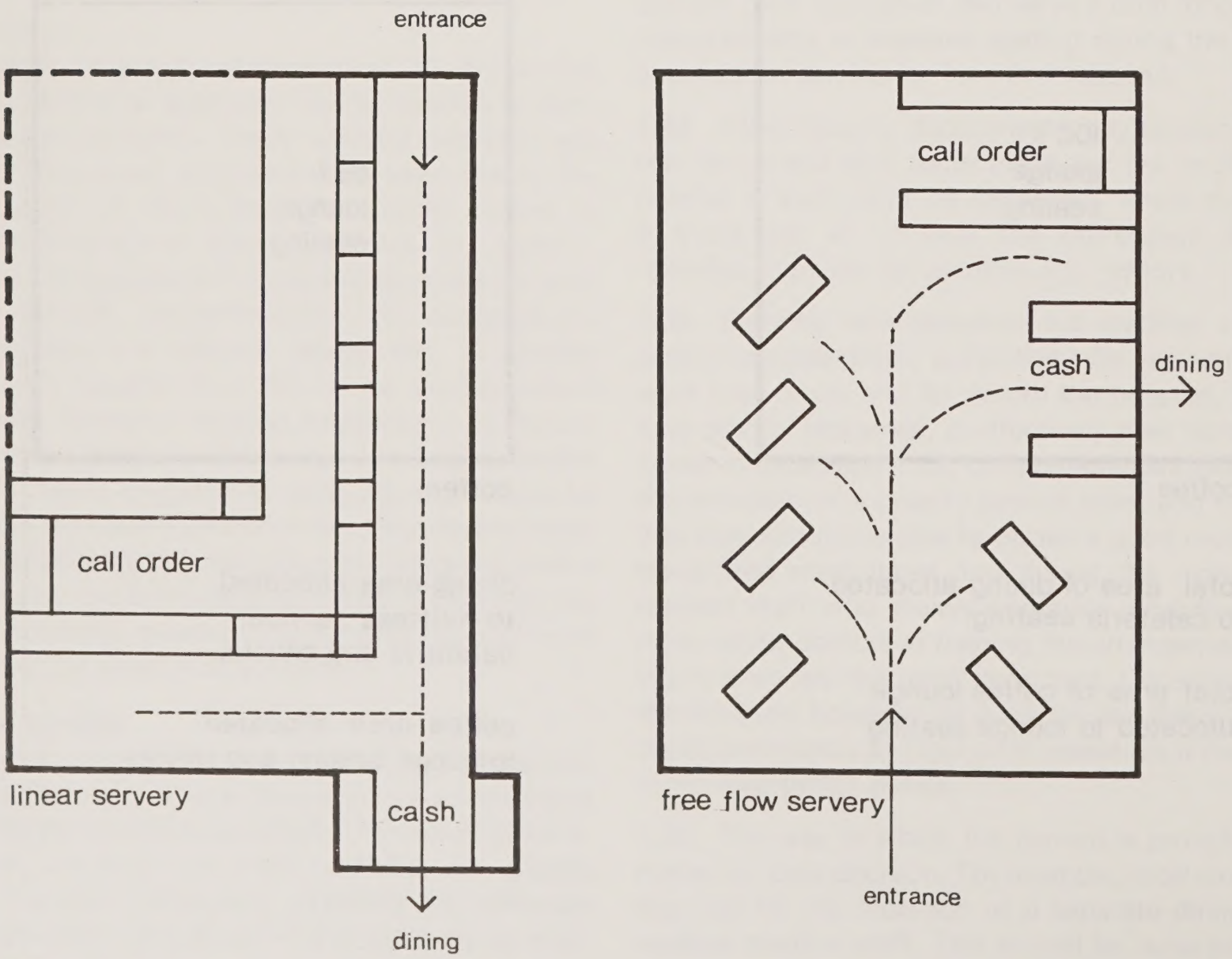


does not involve providing a separate servery or exceeding the normal cost limits for the project. One way of achieving this would be to locate the doctors' common room and any changing facilities adjacent to the staff restaurant (Figure 3) thereby making more effective use of the combined space available. Local medical staff should be consulted about this at an early stage.

1.37 The provision of separate seating for privacy or other reasons can also be achieved by separating parts of the restaurant, by the use of screens, plants, alcoves etc. A separate seating area adjacent to the call-order bar with its associated engineering services controlled independently could also serve as a dining area for staff at night. (1.33) In considering these options it should be borne in mind that many of the modern proprietary systems of screening which are available on the market today combine good standards of visual and aural privacy with a very pleasing appearance. They have the additional advantage of great flexibility and the general effect is more satisfactory than permanent separation.

1.38 All medical staff could use the facilities for meals which may be conveniently available in the accommodation for postgraduate medical education. (1.7 g) This has proved to be an acceptable arrangement for medical staff in many hospitals. Working lunches involving seminars and group discussions are frequently held in this accommodation. Although only a limited menu may be available the advantages of increased confidentiality for doctors will be likely to outweigh the disadvantages. General Practitioners and other doctors from outside the hospital will welcome the opportunity to meet and eat with consultants and junior doctors; doctors in training can benefit from such contacts.

Figure 4 Linear servery and free – flow servery



1.39 Although resident medical staff may choose to use the postgraduate medical accommodation for lunch, they would continue to take their other meals in the hospital facilities provided.

1.40 It is important to maintain the planned range of services, both normal and special, during an interim period of development, or while the catering department is being refurbished.

Types of staff meal service

1.41 In the staff restaurant, meals may be served in one or more of the ways set out in the following paragraphs.

Cafeteria

1.42 This Note assumes a self-service system based on a linear counter. However a 'free-flow' arrangement of separate counter units may be considered for larger numbers, eg over 600 diners. This system occupies considerably more space and has capital and running cost implications. The former system is more economical in space and staffing, but the latter should provide a better throughput and reduce queueing at peak periods. Both options in terms of service units are essentially the same. It is important to provide enough cash-desks to prevent bottlenecks at the exit from the servery.

Call-order

1.43 This may or may not be separate from the main cafeteria. If fully incorporated within the cafeteria it is likely to need extra space by the counter where orders can be awaited without impeding the main traffic flows. A wide variety of dishes can be cooked to order (ranging from snacks to more expensive items according to demand). These facilities may be used for the provision of breakfast, supper and night meals when the main servery is closed.

Waitress

1.44 The financial implications of providing a waitress section will need careful assessment before a decision is taken to allocate a part of the restaurant for this purpose. Those staff who are willing to pay the appropriate surcharge can benefit from a more relaxed atmosphere.

Vending machines

1.45 A vending machine may be installed as part of the restaurant servery facilities and should be available 24 hours a day. It could also be used for night staff when there is a low demand for night meals which would not justify the costs of a staffed service. (1.43) For a night service offering hot and cold meals and beverages, a refrigerated meal vending machine, and a microwave oven for staff to heat these meals, should be provided. A beverage machine providing both hot and cold drinks will also be required. Some hospitals providing this service, use disposable plates and cutlery, which ensures that the tables are not left cluttered with dirty crockery etc.

Clearing dining tables of cutlery and crockery

1.46 Dirty dishes are either cleared from tables by staff or by the diners themselves (3.79) using a self-clear tray system.

Wash-up service

1.47 This Note provides guidance on centralised facilities for the washing and drying of all crockery, cutlery, glassware and trays used by the patients, staff and visitors. A central wash-up makes good use of manpower and resources and ensures that a high standard of hygiene is maintained. A mainly decentralised system which relies on the hand-washing of crockery in various locations is wasteful in labour and materials and will not be as hygienic. However, the collection of cups and saucers several times a day may not be feasible and washing-up in ward pantries may therefore be considered. Extra space would be needed for this. Local washing-up in ward pantries requires washing machines, extra space in which to operate them and storage for cups and saucers. The extra capital cost of providing additional space and equipment and the extra staff and energy costs must also be considered.

Environmental hygiene

1.48 The catering department should be designed to ensure that the highest standards of food hygiene can be achieved and maintained. It is important that the local environmental health officer and the health and safety officer should be consulted for both new and upgrading schemes throughout the planning stages. Full use should be made of the Department's Health Service Catering Manual 'Hygiene in catering departments and food service areas'.

1.49 To prevent contamination it is essential that cooked and raw foods are transported and stored separately at the correct temperature. The use of mobile racks minimises the handling of food and reduces delays. Every precaution should be taken to prevent the entry of insects, rodents and other pests into catering premises. Ultra-violet electrical devices are needed for the control of winged insects in food areas, but these require careful siting for maximum benefit and to prevent contamination of food and preparation surfaces.

1.50 Day to day cleaning will be carried out by the catering staff using the department's own cleaning machines and facilities. Kitchens will also require regular deep-cleaning of walls, ceilings, fans, and ducting; the complete dismantling of equipment, and the thorough cleaning, reassembly and testing of components. Deep-cleaning should be carried out by specialists when the kitchen is not in use, but this may have to be phased to suit departmental needs.

1.51 Stainless steel handbasins should be installed in each of the preparation spaces and in the cooking space; elbow-operated taps are preferable. Hygienic paper towels may be provided for hand drying. To avoid contamination handbasins should not be sited close to food preparation equipment. Catering staff should have changing, shower and WC facilities within the department.

Disposal of food waste and refuse

1.52 The disposal of food waste is a matter of local policy which will depend on the availability of approved contractors to remove it, and whether or not the local water authority has any restriction on the volume of waste food that may be discharged into the public sewer by waste disposal units. In the absence of a suitable contractor the most hygienic and preferred method of disposal is by food waste-disposal units. These units may be located in central

wash-up, pan wash and the meat, fish and vegetable preparation spaces. Where a bulk trolley service is used, waste food may be collected from the wards and day hospitals and brought to the central wash-up for disposal. Waste food from the staff restaurant will be handled in the same way, but the snack bar may need its own disposal unit. The hospital incinerator should only be used to dispose of food waste in an extreme emergency; to prevent cross infection, unpleasant odours and other hygienic problems.

1.53 Refuse and returnable containers should be collected and stored conveniently for the kitchen and loading bay. Refuse may be compacted or incinerated depending on local policy.

Statutory and other requirements

1.54 It is Government policy that health buildings should comply with the technical requirements of all relevant statutes and regulations though at the time of writing not all the procedural requirements of such legislation are enforceable against health authorities as Crown bodies. Health buildings should also comply with all relevant codes of practice and standards. This guidance takes account as far as possible of all statutory and all other requirements currently in force but, nevertheless, health authorities are reminded of their responsibility for ensuring compliance with statutes, regulations, codes and standards.

Fire safety

1.55 At the time of writing Departmental guidance on all aspects of fire safety is being prepared in a number of documents within the Health Technical Memorandum series. It is essential that project teams familiarise themselves with this guidance as it becomes available and the statutory regulations on the subject. In particular, the need for structural fire precautions and means of escape from the whole accommodation must be taken into account at the earliest possible planning stage. Guidance on fire safety as it applies to new health buildings and new parts of health buildings (eg extensions) is contained in HTM 81 'Fire Safety in Health Care Premises—Planning and Design of New Buildings' (a draft of this document has already been circulated within the NHS under the title 'Fire Safety in Health Buildings' dated September 1978).

1.56 During the design stage it is important to establish those aspects of fire safety strategy which affect the design, configuration and structure of a project. The architect and engineer should discuss and verify their proposals with the local fire authority from the inception of the scheme through to completion and ensure that the project team and all other planning staff are fully acquainted with the *fire safety strategy* for the design in terms of operation (staff responsibilities etc), equipment provision, and building and engineering layouts.

1.57 The principles of fire safety apply both to new projects and to alterations and upgrading of existing buildings. When altering or upgrading, any existing fire risks must be eliminated.

1.58 Health Technical Memorandum 83 'Fire Safety in Health Care Premises—General Fire Precautions' dated 1982 describes the major fire hazards in a catering department eg fires caused by fish fryers, and the appropriate precautionary measures.

Smoking

1.59 The recommendations in Health Circular HC(85)22 dated May 1985, (WHC(85)31 dated July 1985 in Wales), have been widely reflected in changing attitudes towards smoking especially as regards catering services. Smoking is not allowed in areas devoted to the storage, preparation and serving of food. It has become customary to discourage smoking in the staff restaurant also, but not yet in the coffee lounge. When the relationship between these two areas is being planned the probability of smoking in the lounge must be reviewed in order to determine what measures are needed to control its unwelcome effects. (1.31, 3.77)

Signposting

1.60 Signposting should form part of the whole hospital policy and be in accordance with the Department's signposting manual, HTM 65, 'Health Signs'.

Disabled people

1.61 It is essential to ensure that suitable access and facilities are provided for disabled people who have problems of mobility or orientation. This includes, besides the wheelchair bound, those who for any reason, have difficulty in walking and those with a sensory handicap such as a visual or hearing impairment. Authorities are reminded of the need to comply with the provisions of the Chronically Sick and Disabled Persons Act 1970 as amended by the Chronically Sick and Disabled Persons (Amendment) Act 1976, the Disabled Persons Act 1981, and (from 11 November 1985) the Building Regulations 1985, Schedule 2. Attention is also drawn to BS 5810: 1979 'Access for the Disabled to Buildings'. One of the effects of the 1981 Act is to apply this British Standard to premises covered by the 1970 Act, which includes those open to the public. Compliance with the British Standard will also meet the 'deemed to satisfy' provisions of Schedule 2 of the Building Regulations 1985 in terms of design.

Design Briefing System (DBS)

1.62 This is a series of documents which are used in conjunction with new or revised Building Notes to help specify user requirements for a Design Brief. Each of the documents adopts a check-list approach providing a framework which guides the project team through the consideration of organisational and planning options and leads to a list of activity spaces. Although the application of DBS is confined mainly to planning complete departments, it can be used also to prepare a brief for extensive upgrading of existing accommodation.

1.63 A copy of the relevant DBS is issued with each Advance Copy of the Health Building Note. Additional copies needed for use by specific project teams can be obtained from Dr R Brigden, Room 625 Euston Tower, 286 Euston Road, London NW1 3DN (tel: 01-388 1188 ext 3382).

2 Design

2.1 This chapter provides design guidance which enlarges upon the catering service philosophy and principles described in Chapter 1. It includes general information, which has implications for design, and discussion of environment, finishes and location. The general workflow of the department is described in relation to the layout and the planning principles of each part and of the whole department in relation to the whole hospital. The chapter concludes with consideration of the problems of expansion and phasing.

Economy

2.2 Economy is important particularly in space provision, maintenance, staff utilisation and energy consumption. The total capital expenditure must be borne in mind, but it is equally important to ensure that running costs are kept to a minimum and that the cost consequences of project decisions are fully considered. A booklet entitled 'Note on the relationship between planning health buildings and the cost of running them' was issued in September 1980 with HN(80)29, (WHN(78)92 in Wales) and should be of interest to design teams. It contains a list of 17 works of reference relevant to the subject, and synopses of some of them. Reference should be made to HN(81)30, dated October 1981, which sets out arrangements for the approval and control of building developments.

2.3 The amount of space for a service or group of services should be no more than is currently needed. Planning should ensure that spaces are used as intensively as possible and are not duplicated. Correct working relationships will help to facilitate economy.

2.4 Materials and finishes should be selected to minimise maintenance and cleaning costs but while being compatible, should also be functional and of a high standard, durable and easy to clean. In particular, floor finishes should be restricted in variety and soft floor coverings should have a backing impervious to fluids. Building elements which require frequent redecoration or are difficult to service should be avoided. Components which are liable to damage such as entrance doors, corners on partitions and counters should be adequately protected.

Damage in health buildings

2.5 When designing and equipping health buildings the likely occurrence and effects of accidental damage should be considered. Damage in health buildings has increased through the use of heavier mechanical equipment for the movement of supplies, and is also due to some extent, to the use of lightweight, often less robust, building materials. Reference should be made to the relevant British Standards and to the advice in the Department's DS (Supply) letter 42/75 dated 5 August 1975, on the buffering of movable equipment. Reference should also be made to the guidance contained in Volume 2 of the HBN Common Activity Spaces.

Security

2.6 Assault on hospital staff and theft of NHS property are, nowadays, recognised problems. The project team should discuss hospital security with the officer in charge of the local Police Crime Prevention Department and the hospital or district security officer or adviser. Fire and Security Officers should be consulted concurrently, at an early stage in the design of the building, for the demands of security and fire safety may sometimes conflict.

2.7 Security will normally be a matter of whole hospital policy. Wherever supplies such as food, utensils, tableware, equipment, linen and cleaning materials etc are stored, precautions against theft will be required, eg cupboards may need lockable doors, windows may have to be barred and, in certain circumstances, there may be a requirement for audio/visual alarms. A safe will be required for cash received in the restaurant and coffee lounge. This will normally be located in the dining room supervisor's office. (3.74)

Critical dimensions

2.8 The diagrams in Appendix 1 contain information on critical dimensions for some of the activities mentioned in this Note which are not included in the 'Common Activity Spaces Building Note'.

Health equipment note

2.9 The guidance on equipment for a Catering Department in the existing health equipment notes 10 and 11 is no longer relevant to this HBN. Consideration will be given in due course to the preparation of new guidance.

ENVIRONMENT

Environment in the kitchen

2.10 The kitchen should enjoy natural light and ventilation with special regard to the amenities of view and prospect for the staff working in this department. The environment should therefore be considered at an early stage so that design decisions lead to a satisfactory solution which provides comfortable working conditions for staff. For example, a kitchen with no natural light to any part of it has a built-in disadvantage.

Natural and artificial lighting

2.11 It may not be practicable to provide each working space with windows but there should be, wherever poss-

ible, some opportunity for staff to see outside. There may be relatively large areas where a direct outside view is not possible. A secondary view through another space however is better than no view at all. Internal spaces may be provided with daylight from rooflights where the building form and engineering services allow this. Rooflights should be made bird-proof and should have drainage channels to prevent the contamination by moisture of food in the kitchen below. It is important to consider the building orientation at the early planning stage. Excessive glare and solar gain can cause discomfort. Blinds create an added cleaning problem but glare can also be reduced by lowering the window head. External screens can be used to control solar gain. All these considerations, and their effect on the heating and ventilation system, are important in determining the desired amount of glazing in walls and roofs.

2.12 Windows should be lockable, fitted with insect-proof screens, and positioned so that they do not cause draughts.

Mechanical ventilation and heating

2.13 The design of the kitchen must accommodate a ducted air heating and ventilation system which may be located above a suspended ceiling. (4.20) The catering department is likely to have its own plant space adjacent to the department or on the roof. The system must be capable of maintaining the required air flow rates and temperatures in each of the kitchen work spaces. Canopies for extraction will be required over each of the groups of cooking equipment. These should extend beyond the face of the equipment to contain all heat and steam.

Noise

2.14 Owing to all the hard surfaces in the kitchen there is little scope for noise absorption and the general clatter of metal utensils and noise from machinery can be a problem. While ceiling finishes will generally be smooth and impervious, there are some spaces where the use of sound-absorbent ceilings may be provided, eg the tray preparation area and the kitchen offices. (2.26–2.31)

Environment in the restaurant

2.15 The need to create a pleasant atmosphere, attractively decorated and furnished, with carpeted floors and soft lighting, has been referred to in Chapter 1. Overall design, shape and layout can help in creating the required atmosphere. The restaurant may be very large in area and the shape given to it can be very important. While smaller restaurants could be rectangular in shape larger ones may require a more interesting shape which can be sub-divided in different ways. The ambience in the restaurant may depend upon the ways these sub-divisions are handled in the design. The use of shape, dividing screens, arrangements of plants and the grouping of seats requires careful design consideration. The allocation of space for different types of seating for the restaurant or coffee lounge is described in the functional requirements section. (3.76–3.81)

Natural and artificial lighting

2.16 While the restaurant should be located centrally for the convenience of the staff, it is also desirable for it to have views out beyond the hospital. If the location of the restaurant does not afford any views to the outside an internal courtyard could be used to provide a limited view and additional daylight. Blinds or curtains may be required to control glare and solar gain. Outside spaces could be planned for use in summer time as an extension to the coffee lounge. Lighting arrangements in the restaurant must be flexible to cope with changing demand. The pattern of artificial lighting over the whole area must also be flexible in its switching arrangements so that sub-sections may be lit as desired. A section of the restaurant will need to be lit separately for night time use. Lighting levels should be used to produce a pleasant atmosphere; these may be lower in the coffee lounge than in the restaurant. Lighting in the main staff servery, call-order bar and coffee servery will need to be brighter than in other parts of the restaurant.

Natural and mechanical ventilation

2.17 Natural ventilation in the restaurant will need to be supplemented by mechanical ventilation if some areas are not adequately ventilated by natural means. As smoking will take place in the coffee lounge mechanical ventilation will be required to maintain a reasonable smoke-free atmosphere. Mechanical ventilation, using canopies where necessary, will be required in the servery spaces and call-order bar.

Noise

2.18 Noise levels in the restaurant should be reduced to appropriate levels by the use of sound-absorbent finishes on floors, ceilings or walls and the use of curtains at the windows. Serveries and wash-ups generate noise and consideration should be given to the type of screening needed to reduce the transmission of noise between these and the restaurant.

FINISHES

Finishes in the kitchen and serveries

Floor finishes

2.19 Throughout the bulk provisions store, cold stores, preparation areas, cooking area, serveries and wash-up a uniform floor level must be maintained. The kitchen and serveries floor finish must be hard wearing and easy to clean but with a non-slip finish. Quarry tiles or vitrified ceramic tiles are suitable. The use of figured, raised-pattern or irregular shaped tiles should be avoided as they are difficult to clean and the passage of trolleys across them is noisy. The flooring should be turned up at walls in an integral coved skirting which should form a continuous finish with the floor and be flush with the wall finish. The junction between the skirting and wall finish should not provide a ledge for the collection of dirt. Coved skirtings with pre-formed corners are less vulnerable to damage than skirtings in which the corners are formed in situ. The corner formed on site is difficult to form neatly and is easily torn away by the movement of trolleys or cleaning equipment. Joints should be narrow to minimise moisture penetration and they should be dark in colour so that they do not show staining.

2.20 The choice of the finish, and the design of the screed and sub-floor should take account of the heavy traffic of trolleys and the occasional movement of heavy equipment on pallet trucks in the kitchen and stores areas.

Walls

2.21 Walls within and surrounding the kitchen should be of solid construction. Where it is necessary to use hollow partitions they should be constructed to allow treatment against infestation. This may be achieved by perforations in the partition framework to allow the penetration of gases or fine powders blown under pressure. Access points should be provided at 2500–3000 mm centres. Modified electrical boxes with blanked face plates could be used for this purpose.

2.22 Wall finishes must be durable and easy to maintain and clean. In the kitchen and serveries walls should be tiled with hose-proof grout to a minimum height of 1800 mm in glazed ceramic tiles. The wall finish should be flush with the coved floor skirting. Other wall surfaces should be plastered to a hard, smooth finish and painted with a good quality washable finish.

2.23 In certain areas the kitchen walls are vulnerable to damage and must be protected. The need for additional protection should be considered for each of the spaces in the kitchen. The pan-wash space is probably the most vulnerable and the wall areas require a very durable finish. Stainless steel is one way of providing the protective finish behind the pan-wash sinks and storage racks. The causes of damage, eg catering trolleys, pallet trucks or plate dispensers, should be noted. The appropriate type, position and correct height of protective linings or buffer rails, should then be defined. Where possible, buffering should be specified on the mobile equipment. (2.5) This is one of the most effective ways to reduce damage. Where traffic is heavy and trolleys are used, all door linings and external corners on walls will require protection.

Doors

2.24 Kitchen doors should be a simple design flush with adjacent surfaces and wide enough for trolleys and equipment to pass through easily. They will need to be protected and external doors should be rodent proof. All doors should be fitted with glazed panels for visibility and to prevent accidents. Wired or safety glass should be used in these panels.

Windows

2.25 To reduce solar glare tinted glass may be used; blinds present a cleaning problem. Working surfaces and sinks are generally at about 900 mm and some have upstands above this at the back. Sill heights of 1200 mm provide enough solid wall to take electric outlets above worktop height without reducing the outlook, but for stores these may be at a higher level to ensure maximum utilisation of available wall space and security. Windows should be insect proof, openable ones lockable. All should be accessible for cleaning.

Ceilings

2.26 The kitchen ceiling must provide for the complicated functions described below, but it is of primary importance that the type of ceiling chosen is hygienic, economical and easy to maintain.

2.27 Light fittings should be totally enclosed, close ceiling mounted.

2.28 Where kitchen services are carried overhead they should be located in the ceiling void of a suspended ceiling construction. The design of the ceiling may incorporate roof lights and must provide for canopies (which may be an integral part of the ceiling) over cooking equipment etc. The finish selected for the ceiling must take account of the type of construction and the requirement for access to services above the ceiling. A continuous, smooth, impervious, easy to clean finish is desirable in areas where steam and grease are produced. If a large number of access hatches are necessary the advantages of ceiling continuity may be reduced owing to the joints where hatches occur. In addition to access hatches and canopies, a large number of air inlets or extracts will be required throughout the kitchen spaces.

2.29 Canopies should be constructed in such a way that they do not contain cracks, ledges, light fittings or conduit which form grease-traps. If light fittings are incorporated in the canopy, the conduit should be mounted externally. Georgian wired glass panels in canopies allow in borrowed light and are easy to clean. (4.31)

2.30 The activities of the kitchen are noisy and the noise may be exaggerated by the hard finishes which are required. Consideration may be given to reducing noise by the use of sound-absorbent ceilings in certain parts of the kitchen. (2.14) Preparation spaces and tray preparation services may not contain such large amounts of steam and grease as the cooking space and if noise is reduced in these spaces it would be of benefit to the people who work in them. Sound-absorbent ceiling finishes, such as perforated metal pans with an absorbent backing, may be considered suitable in these spaces. Access through this type of ceiling is easier than access through continuous plaster finishes and does not increase the number of joints in the ceilings. The benefits of noise reduction must be weighed against the possible higher maintenance costs of such ceilings and where infestation is a potential problem they may not provide a practical solution.

Finishes—general

2.31 Spaces such as offices and staff rest room should be provided with ceilings with good sound absorption and where appropriate, carpets and curtains can also contribute to the reduction of sound reflective surfaces.

Finishes in the restaurant

2.32 The need to create a pleasant atmosphere, attractively decorated and furnished with carpeted floors and soft lighting, had been referred to in Chapter 1. Finishes in the restaurant servery will be similar to those in the kitchen. (2.19, 2.22) The floor finish of the servery should extend to include the queueing space in front of the counter. This floor space is subject to heavy wear and tear. The specifications for walls and ceilings should allow for damp cleaning with a neutral or alkaline detergent at regular intervals.

Floor finishes

2.33 Soft floor coverings are suitable for the restaurant and coffee lounge. For further information on soft floor coverings see the Report of the Floor Covering Study Group issued to Health Authorities with HN(78)32, (WHN(78)92 in Wales).

Wall finishes

2.34 Where walls are painted, they should be finished with good quality emulsion paint. In selected areas other wall finishes may be desirable. Within the limitations of cost, the careful use of other decorative finishes may add to the attractiveness of the restaurant. Wallpapers or tiles may be applied to surfaces or, with careful design, the structural finishes of concrete, brick or timber may be left either unfinished or painted. The problems of cleaning and maintenance must always be borne in mind.

Partitions

2.35 Partitions may be required for the separation of parts of the restaurant. The coffee lounge may be separated from the dining areas, a waitress service section may be separated from the main seating or the queueing and servery space may be separate from the dining space. There are a number of reasons why partitions may be required. Privacy may be desired in some spaces, smoking and non smoking spaces may need to be separated or the reason may be noise, which is a reason why separation of the servery may be desirable. The type of partition will depend upon the reason for which it has been provided. Full height partitions may be required for effective sound separation whereas low height partitions may be adequate for separating a snack area from other dining areas. Partitions may be fully or partially glazed where privacy is not essential. Flexibility in the use of the restaurant should be considered when partitions are designed. They may need to be relocated to meet alterations in seating arrangements.

Windows

2.36 The need for daylight and views out from the restaurant has been stated. (2.16) Where it is practical windows should be openable to provide some natural ventilation. Glazed doors may provide access to outside spaces. Depending upon the aspect, solar glare or solar gain may cause a problem and blinds or curtains may be required. The provision of curtains may help to create a pleasant atmosphere in the restaurant and they may also be required for night time use. When at ground floor level or opening on to a terrace, windows may be full height.

Ceilings

2.37 A variety of ceiling finishes may be used in the restaurant where the requirements for hygiene are not as stringent as those for the kitchen. Artificial ventilation will be required in internal spaces and in the coffee lounge where smoking will take place. The ceiling void will house the service ducts for which access will be required. Light fittings could be recessed into the ceiling, or surface mounted. In order to reduce the noise of conversations and the clatter of cutlery the ceiling finish should be sound-absorbent. Perforated metal pans with a mineral backing, mineral fibre tiles or other applied acoustic finishes are suitable. Where concealment of building services is not applicable the volume of the space could be increased by omitting any form of suspended ceiling revealing the structure above, which could be unfinished or painted, eg a concrete waffle slab.

LOCATION

2.38 The functional relationships between the catering department and other hospital departments need careful consideration. The following requirements should be noted:

a. It is very desirable if the whole of the catering department is located at ground floor level. Where, for reasons of planning convenience or economy, this is not possible, the bulk provisions store may remain at ground level, for convenient deliveries, while the kitchen may be located on an upper level. In such a location the kitchen may benefit from the provision of a higher ceiling or rooflights and from easy location of plant rooms. The kitchen should be on the same level as the staff dining room and, where possible, on the same level as the main wards.

b. The kitchen is an area with a high fire risk and should, where possible, be located away from areas of high life-risk eg wards. There should be good access to the kitchen for fire fighting appliances.

c. The department should be close to the external supply point of the hospital, with vehicular access, unloading bay and associated storage.

d. Food being conveyed to and from the stores or the kitchen must not be exposed to the risk of contamination.

e. Dirty areas like those for waste collection and incineration should be completely separated from food stores.

f. The kitchen should be located centrally to supply meals to patients within the shortest time.

g. The staff restaurant should be in a central location and easily accessible to staff.

h. The catering department preferably should be located away from departments which produce contaminated effluents to the air or to drains eg pathology. The air handling and drainage systems should be designed to avoid the possibility of contamination of the drains or air intake of the catering department.

j. Access to the mortuary and post-mortem rooms should not be visible from the dining areas.

2.39 These requirements indicate that the most convenient location for the catering department is at ground floor level. This may not always be possible, however, particularly in the case of upgrading/extension works. If it is necessary to split the catering department between different levels, some additional space may be required. Since a good relationship between the kitchen and the patients' tray service area is essential there are only two practicable alternatives for a vertical separation worth considering:

a. where the bulk provision store is at ground floor level and the rest of the department at another. A reliable vertical connection must be provided between the bulk provision store and the stores in the kitchen.

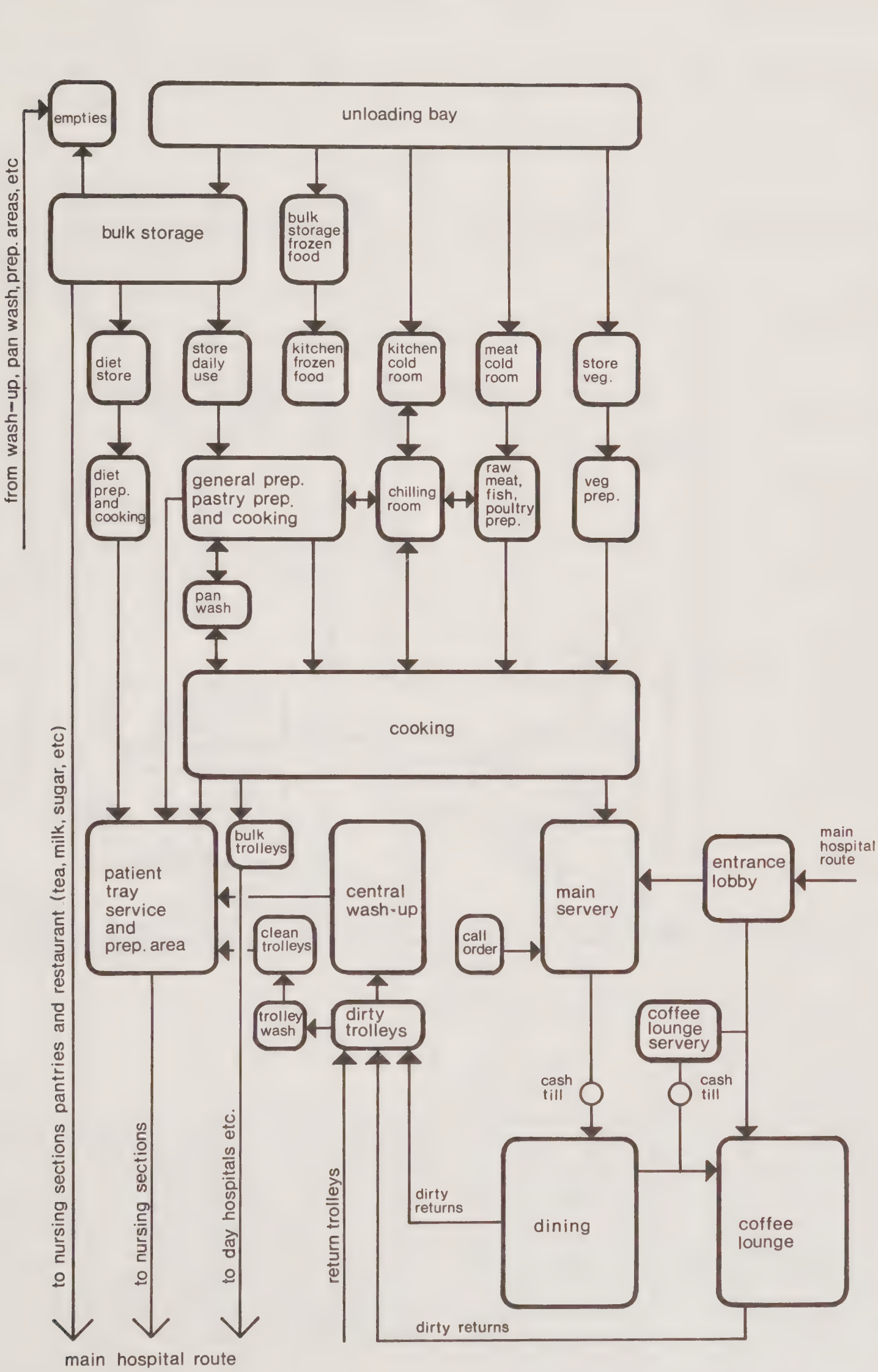
b. where the staff restaurant is at another level from the kitchen and stores. Additional servery equipment is required in the kitchen with a reliable vertical connection to the service point in the restaurant.

WORKFLOW

2.40 The catering department is essentially a processing plant which provides a service to the hospital. The storage, movement and processing of materials should be organised as shown in Figure 5. This organisation may be hindered or enhanced by the shape of the building and by the layout of spaces and equipment within it.

2.41 Figure 5 shows the general workflow in the department including storage, kitchen, serveries, wash-up and restaurant. Workflow in the stores and kitchen is linear and consists of a series of blocks representing the functions of unloading, bulk storage, kitchen storage and preparation, leading directly to cooking and service. This diagram is the simplest and clearest view of the workflow principles in the kitchen. Good planning solutions should not distort this pattern to an unacceptable extent.

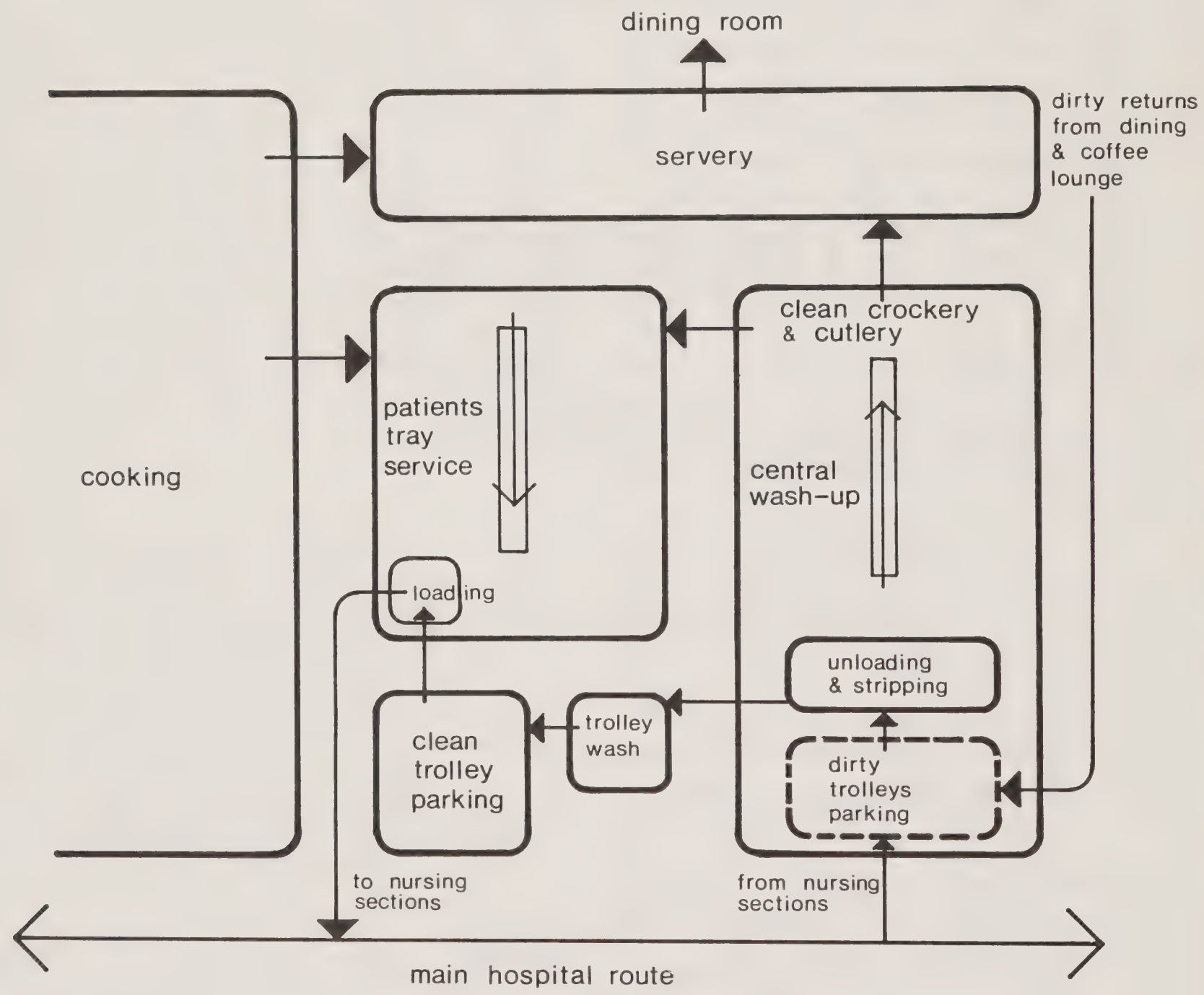
Figure 5 General workflow: kitchen and restaurant



2.42 After cooking, workflow becomes more complicated. It proceeds directly from cooking to patients' tray service, bulk trolley service or restaurant servery. From the patients' tray servery the flow of trolleys along the main hospital route to the wards is of primary importance. Return trolleys bring dirty returns from the wards to a dirty trolley holding and stripping space at one end of the central wash-up. From here, trolleys proceed through a trolley-wash to be parked ready for use in the clean trolley parking area adjacent to patients' tray preparation. Dirty trays taken from the trolleys are stripped in central wash-up and their contents washed. The central wash-up needs to be well placed so that dirty items returned on the trolleys and from the staff restaurant arrive at the dirty end of the wash-up. (see Figure 6)

2.43 The main flow of diners in the staff restaurant is from the main hospital route via the entrance to the serveries where queues may be formed. From here diners proceed to the dining area and coffee lounge. The return of dirty dishes from the restaurant to the wash-up is also an important flow. The flow of trolleys to and from the wards and the flow of diners to the restaurant are the primary flows relating the catering department to the main hospital routes.

Figure 6 Patients tray service, wash up, trolleys parking



2.44 These are the principles of workflow in the catering department. Every attempt should be made to adhere to them in planning and there must be overriding reasons for compromising them. As far as possible crossflows should be avoided, although it will rarely be possible to avoid all of them. Where crossflows are unavoidable they are more acceptable on minor flows involving small amounts of materials or people than on the more important and heavy flows. One problem commonly found is the crossing of the staff diners' queue to the servery by trolleys returning dirty dishes from the restaurant to wash-up. Where it cannot be avoided it may be acceptable, provided that the crossflow does not occur at a congested point of the diners' queue. The siting of vending machines etc should not further complicate this crossflow. Workflow may be interpreted in many ways in different plan forms, some of which will be discussed in the following paragraphs. The principles of workflow apply equally to each activity space and these are described in Chapter 3.

LAYOUT

2.45 There are many ways of putting the functional parts of a catering department together into a suitable plan. A layout will be affected by:

a. local policies, eg supplies, storage and distribution

b. catering operational policy

c. the structure of the building and the available space.

2.46 These factors lead to planning decisions which affect the shape of a plan and the relationship of its parts. Some catering departments will be planned within simple rectangular shapes but if the areas become too large it may be difficult to light and ventilate the internal spaces. For these reasons some departments may be planned to incorporate courtyards or recesses in the building shape. All these affect the nature of the plan which may be designed for a project.

Relationship to the hospital

2.47 A catering department may be located within the services area of a hospital. (Figure 7) Although it is likely to be surrounded by other services departments it should have a direct relationship with the main hospital routes.

2.48 A department may be in the simple and economic shape of a rectangle subdivided into a kitchen and restaurant. (Figure 8) If these are both related to a single main hospital route, it will have an effect upon the circulation patterns within the department.

2.49 A kitchen and restaurant related to a main route in this way will contain an inevitable crossflow between dirty returns from the restaurant and the staff queue at the servery. (See Figure 8)

2.50 A catering department located at the junction of the main hospital route and a services branch may be planned to avoid such a crossflow. (Figure 9)

Figure 7 Catering department in whole hospital context

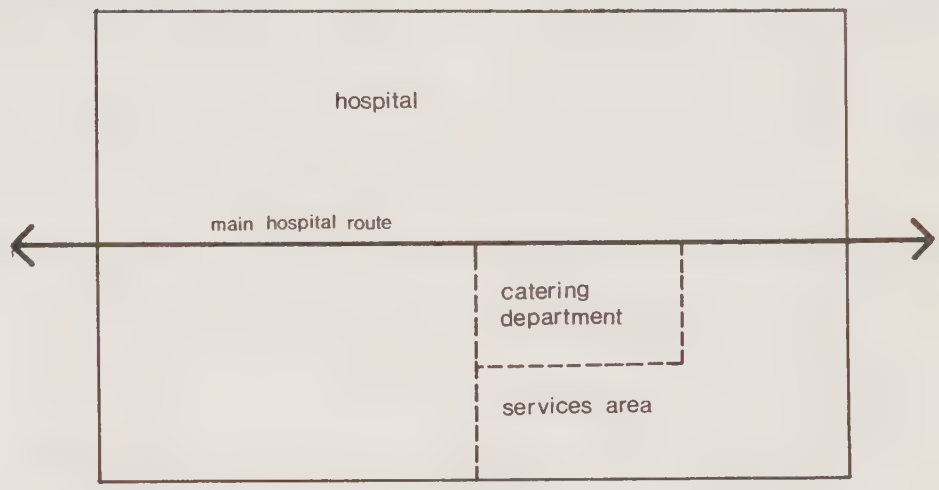


Figure 8 Kitchen and restaurant related to single hospital route

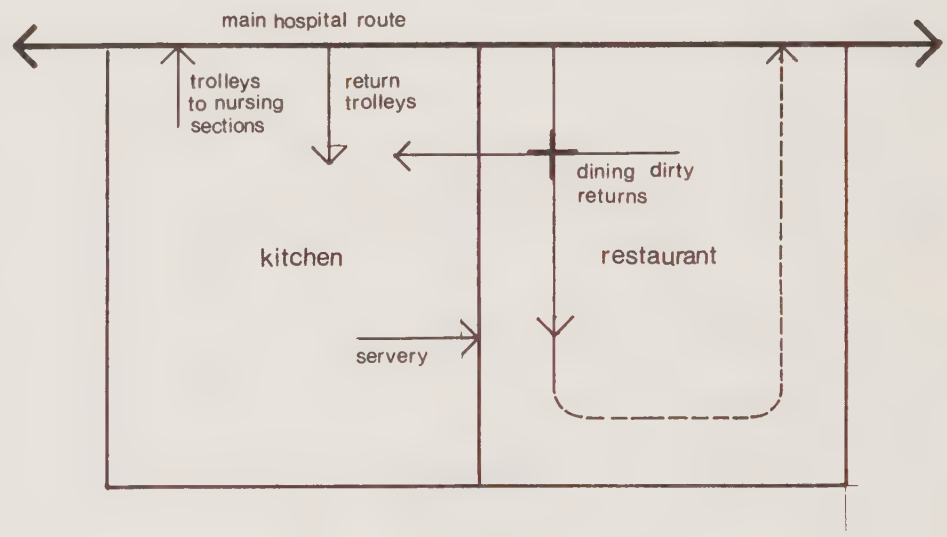


Figure 9 Catering department related to hospital route and services route

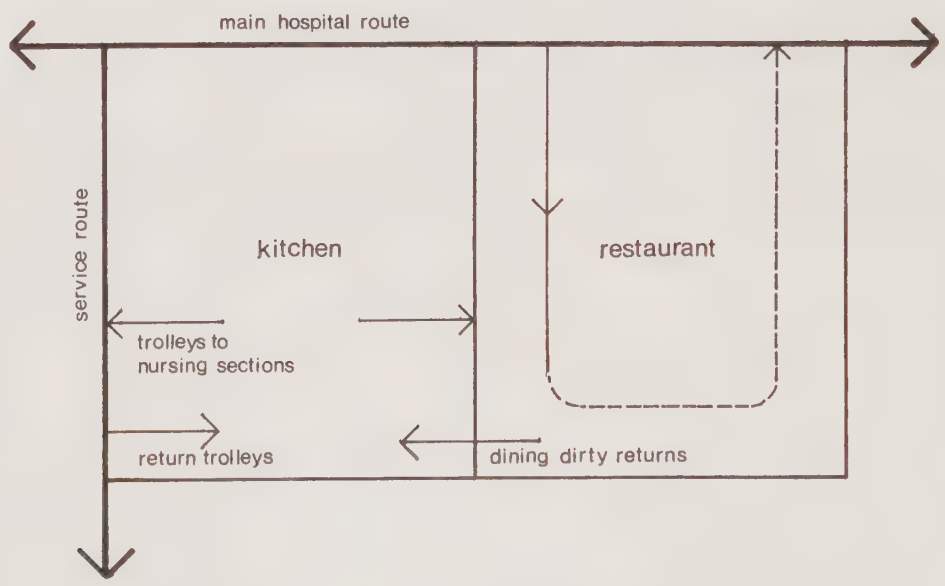
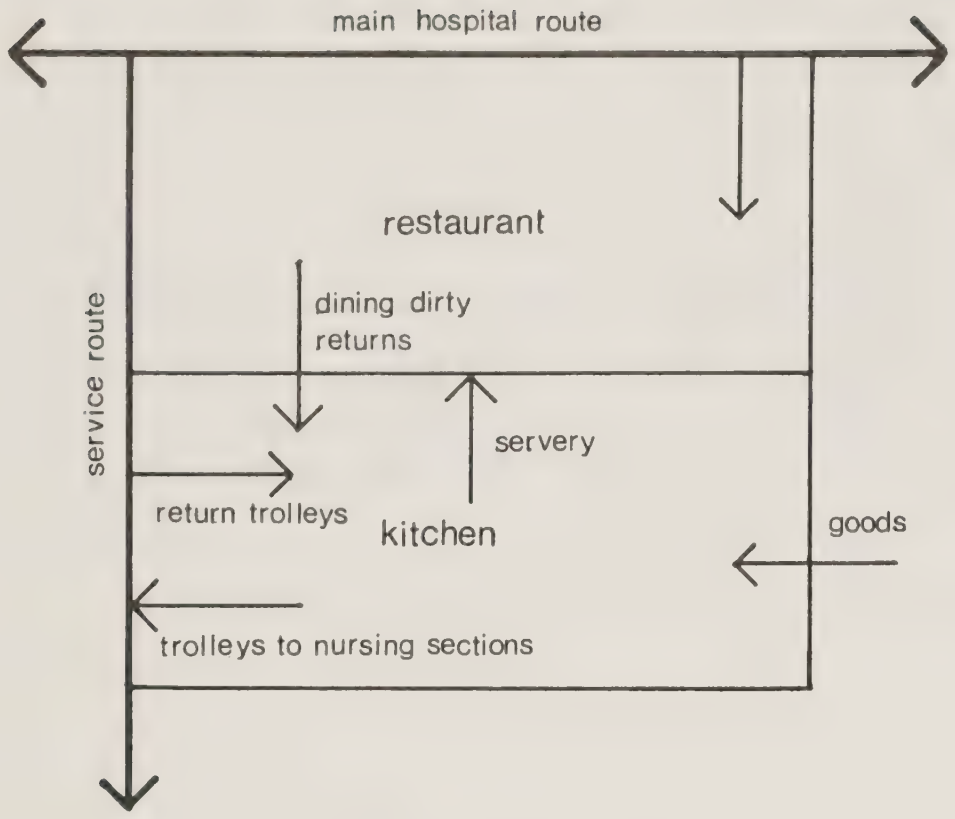


Figure 10



2.51 There are a number of ways of relating the kitchen and restaurant to the main routes. The restaurant may be located between the kitchen and the main route allowing the kitchen to be connected to the services branch only. (Figure 10)

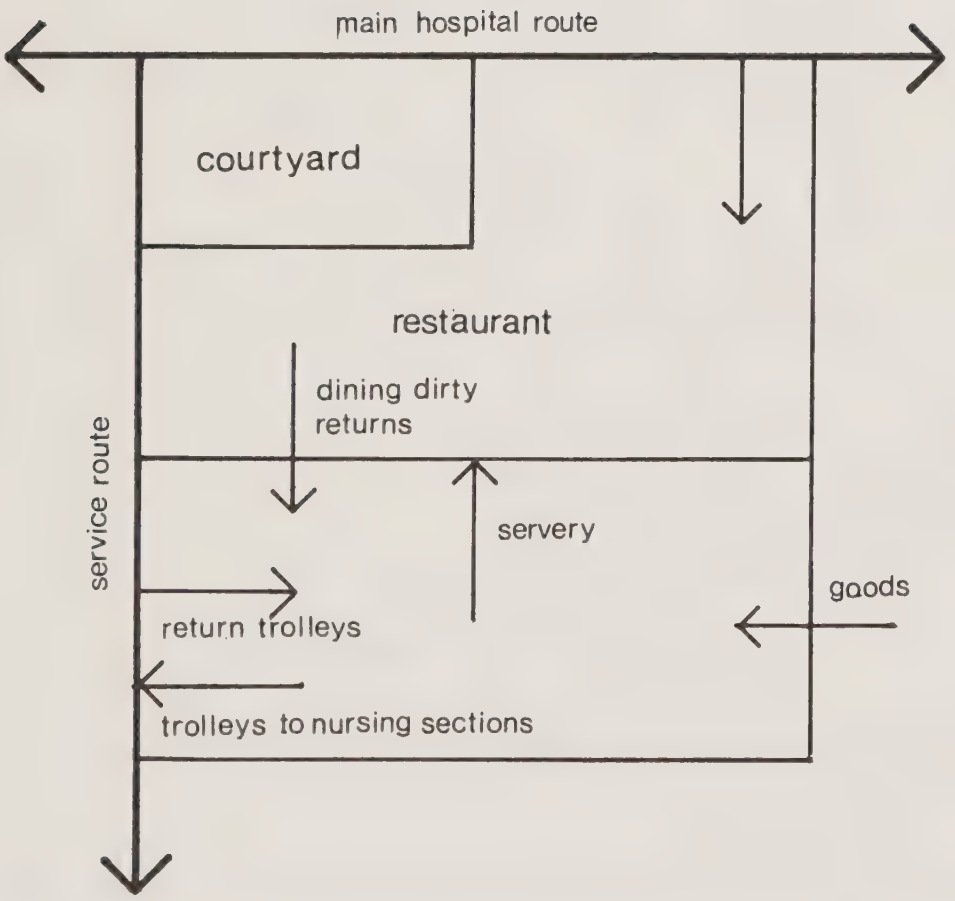
This arrangement has a number of advantages:

a. it eliminates major crossflows

b. it allows a clear linear workflow through the kitchen

c. the restaurant may be easily subdivided or varied in shape. (Figure 10A)

Figure 10A



2.52 The relationships of kitchen, restaurant and main route described here are fundamental and many variations may be derived from them. Each catering department must be planned within the context of policies which have been chosen for the project and within the development planning context of the whole hospital. This will provide the rules for the:

a. overall shape of the department

b. relationship with other departments

c. relationship of kitchen and restaurant to main hospital routes

d. relationship with any existing catering facilities.

2.53 A department layout should not be determined solely by external considerations. While considering the department planning context it is essential to obtain a good internal relationship of functions. A project solution must achieve a careful balance of the external and internal influences. Compromise is always necessary when designing but only within acceptable limits of good catering planning and practice.

Figure 11 Stores and preparation

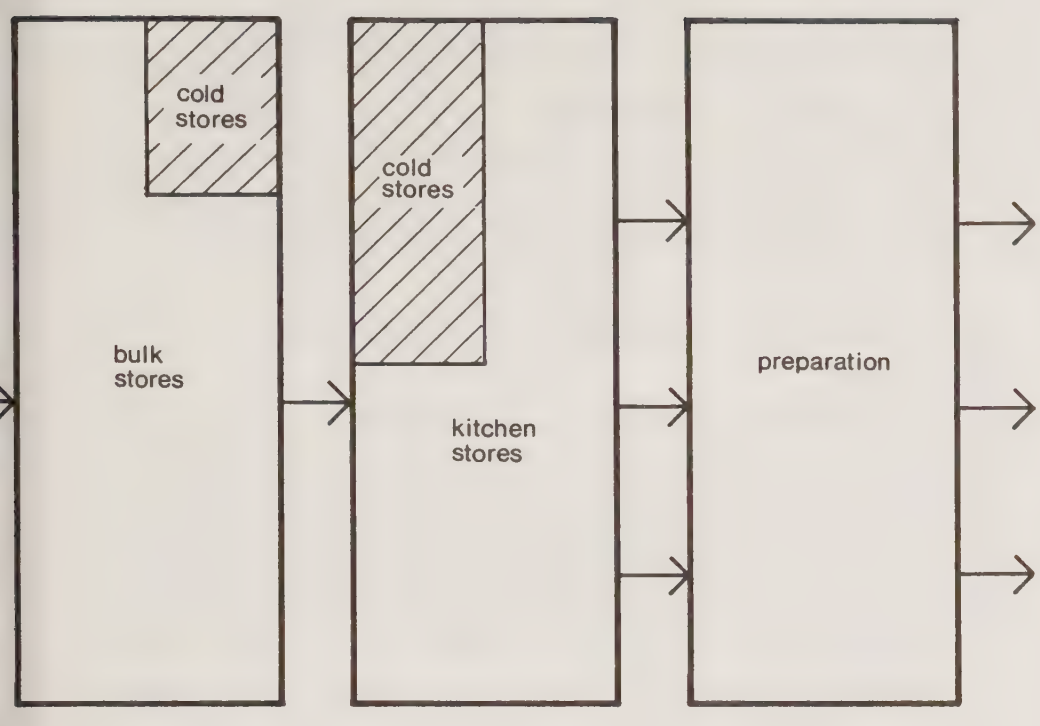
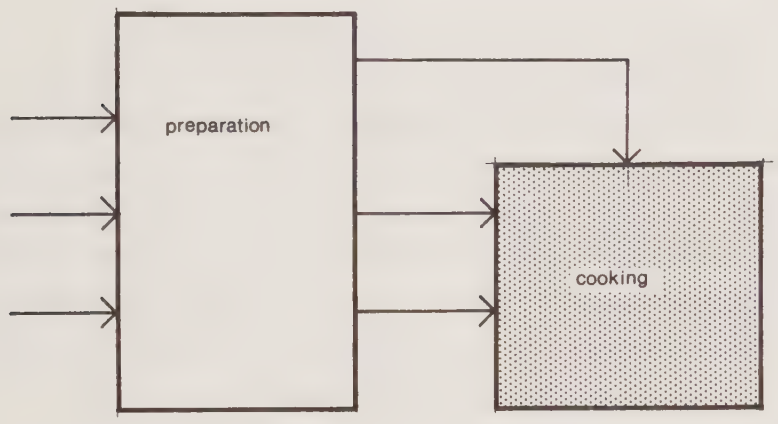


Figure 12 Preparation and cooking



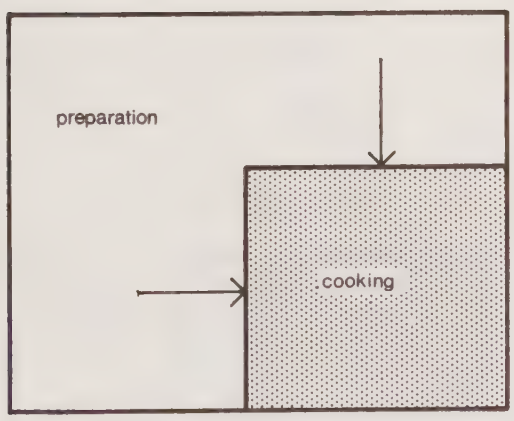
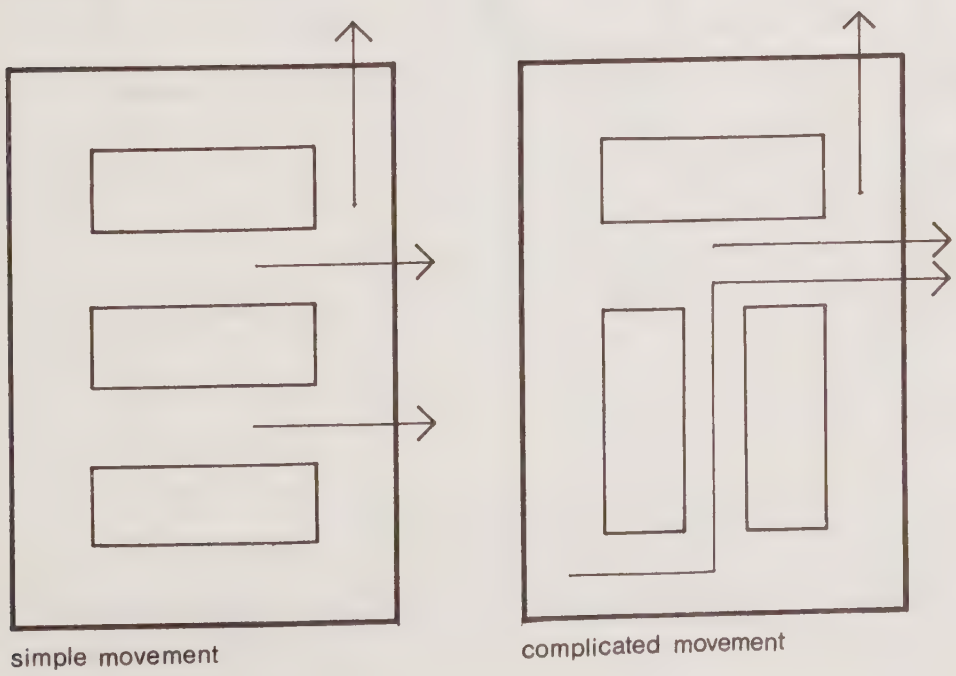


Figure 13 Cooking space



Planning relationships within the kitchen

2.54 The successful planning of the catering department depends largely upon the relationship of functions and spaces within the kitchen. The preceding paragraphs have looked at the principles of workflow and the relationships to hospital routes. The following paragraphs describe the logical sequence in between those points and the planning relationships which result.

Stores and preparation

2.55 The catering bulk provision store should have good access both for deliveries from outside via the hospital loading bay and for the movement of goods to the kitchen storage spaces. Where bulk stores are at a lower level than the kitchen a conveniently located hoist is essential.

2.56 Kitchen refrigerated stores should be grouped for good work flow, economy, and ease of engineering. All kitchen stores should have direct access to their related preparation spaces. Raw meat and vegetable stores must be planned to avoid the need to carry goods through the cooking area to the stores.

Preparation and cooking

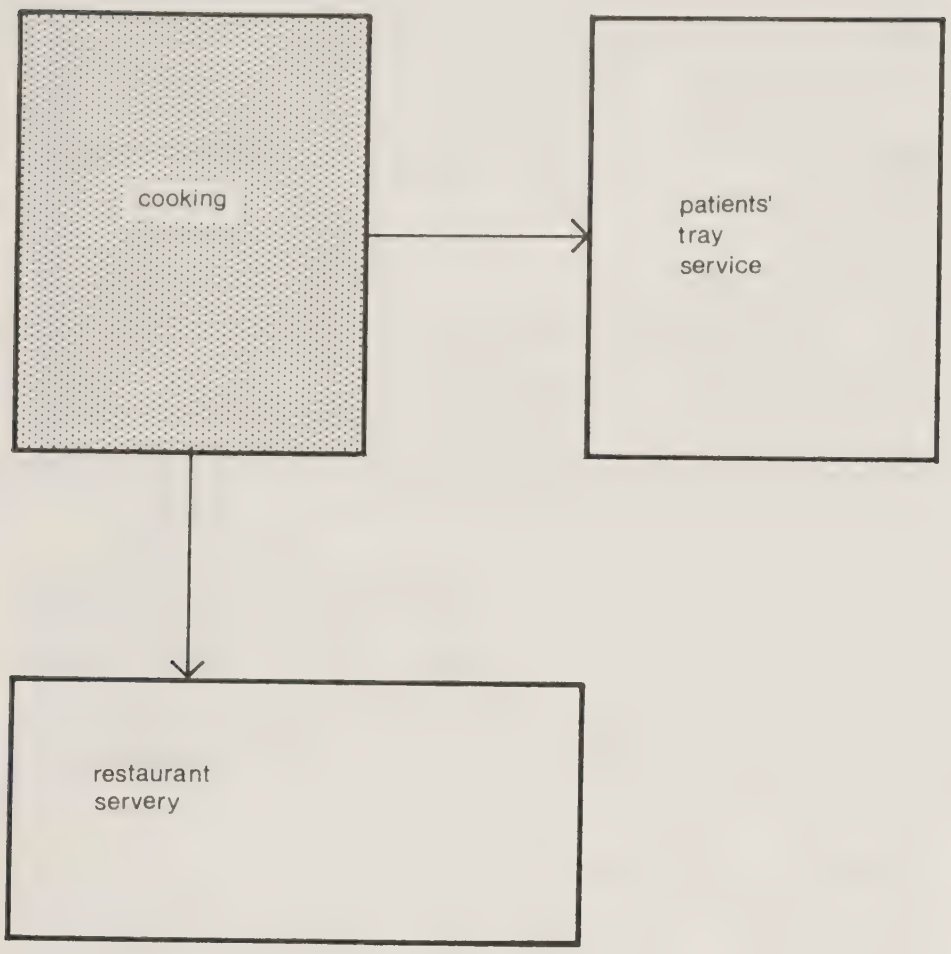
2.57 Preparation spaces should have direct access to the cooking space. The number and size of the preparation spaces will usually mean that they have to be aligned along at least two sides of the cooking space and should be related to the layout of cooking equipment. These should be arranged around the cooking spaces in a simple and clear manner. Complicated relationships create complicated movements which, in a kitchen, are a safety hazard.

Cooking space

2.58 The layout of cooking equipment within the cooking space is most important for safety and efficiency in the operation of the kitchen. Different types of cooking equipment may be grouped into banks. For example a 'wet' bank which includes boiling pans and steaming ovens. This bank may need a steam supply and will need condensate drains and floor drainage to cope with spillage from cleaning and emptying boiling pans. (2.20) Ovens and boiling tables may be in one bank and frying equipment in another bank. The selection and grouping of equipment will depend on local project or operational decisions.

2.59 Each bank of equipment may be supplied by its own spine of services. (Figure 16) The arrangement of banks should be uncomplicated and clear and should result in safe and efficient operation. Banks should be kept short to avoid unnecessary walking by staff. Routes around the banks of equipment in the cooking space should be as short and straight as possible for staff carrying trays or moving trolleys. There should be a clear progression of work from the preparation spaces through the cooking space and into the servery spaces.

Figure 14 Relationship of the cooking space and serveries



Relationship of cooking space and serveries

2.60 The cooking space requires a direct relationship with both the patients' tray service space and the restaurant servery. The patients' tray service space should be adjacent to and on the same level as the cooking space. It is preferable for the restaurant servery to have a similar relationship but where the restaurant and servery are on a different floor level there must be a conveniently located hoist to connect the servery to the cooking space.

Relationships of wash-up and trolley handling to tray preparation

2.61 The central wash-up space deals with return of dirty dishes from patient areas and from the staff restaurant and coffee lounge. This space will normally be placed between the restaurant and the patients' tray preparation space where it is convenient for both. Dirty dishes and trolleys should enter at one end of the wash-up. At the other end after washing, clean dishes will be returned to the patients' tray area and the serveries and trolleys to the trolley park adjacent to the patients' tray preparation space. Any alternative plan arrangement must satisfy all these relationships.

Layout of services in the cooking space

2.62 The equipment in the cooking space needs to be supplied with electricity, gas, steam, hot and cold water services. Connections, which are usually at the back of equipment, often include valves and controls which require space for fitting, maintenance and cleaning. Sufficient space should therefore be left to allow access to equipment placed against a wall, or grouped on island banks with a central spine of services.

Figure 15 Relationship of cooking space to patients tray service and wash up

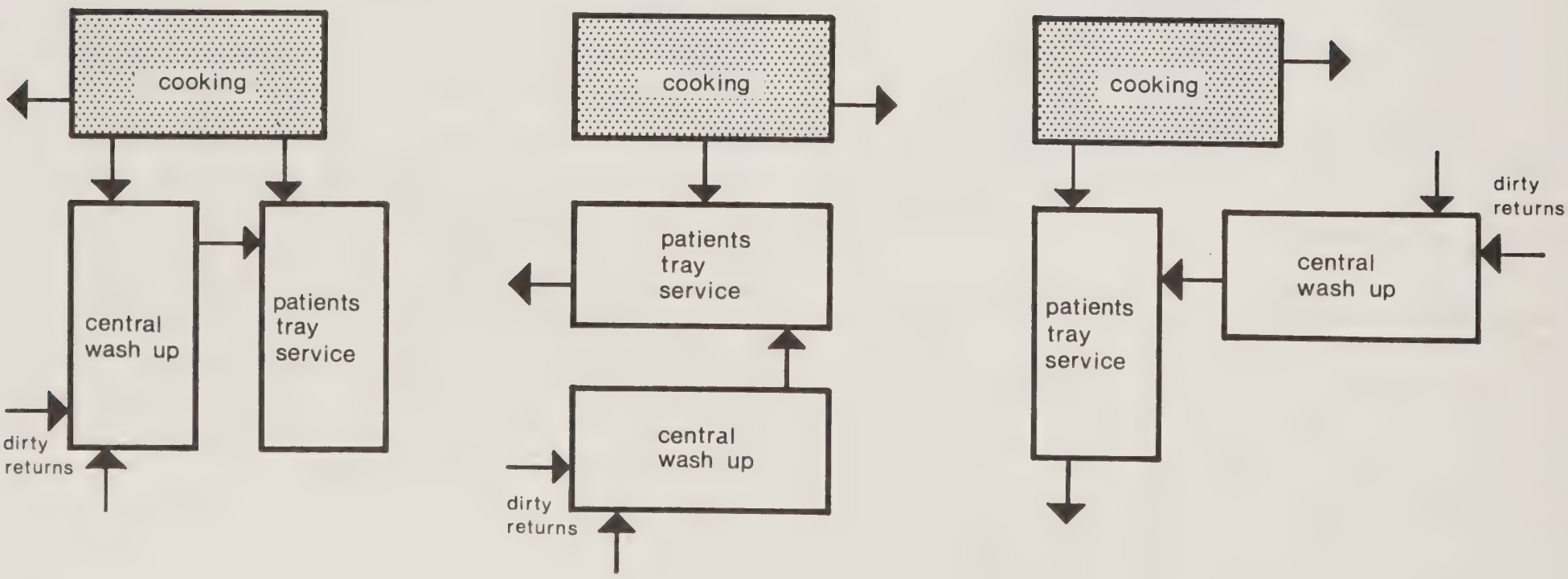
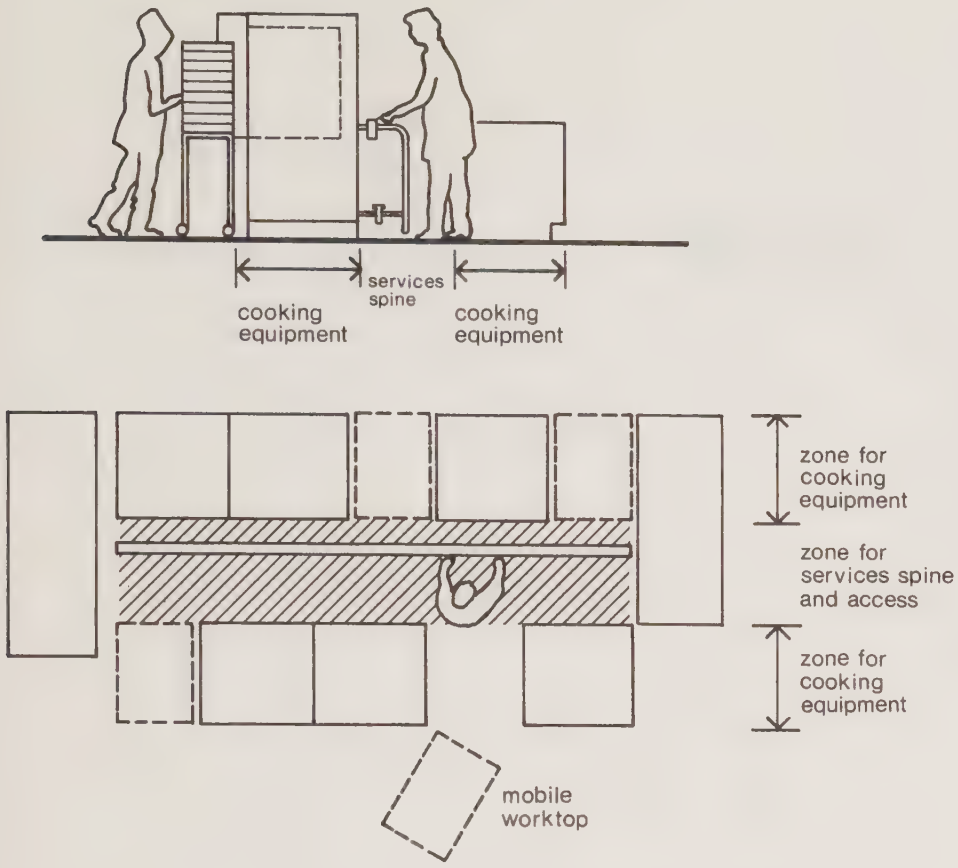


Figure 16 Cooking island with services spine



2.63 The space between rows of equipment must allow access for engineering maintenance and regular cleaning. Movable worktops alongside cooking equipment also permit easy access to the spine of services. Proper access will enable floor outlets to be reduced to those required for drainage and steam condensate. Other services can be supplied from above or below at one fixed point at the end of a spine. The provision of flexible service connections will allow cooking equipment on legs to be moved with the aid of a hydraulic trolley. Other equipment may have built-in rollers.

EXPANSION AND PHASING

Expansion of existing facilities

2.64 In most hospitals, the workload of the kitchen is different from that for which it was originally designed. Operational policies are subject to change, eg the food preparation method and original brief may differ from the actual operation of the department.

2.65 As a hospital expands and places an increased workload on the catering department a point will be reached when the existing facilities are judged to be unable to cope. While there is no directly quantifiable relationship between the areas provided for the kitchen and the number of meals served, there is a gross relationship. For example, a kitchen cannot double its output without considerable modification, nor can the dining room cope with twice the number of meals for which it was originally designed. When major changes are required, the whole range of variables must be examined. These variables will include:

a. increasing the throughput of the department by more intensive use

b. varying the capacity of individual spaces and upgrading equipment to increase the total throughput

c. changing operational policies to improve utilization of available space

d. increasing the space for catering by taking over part of another department or by extending the existing catering building

e. reconstructing the whole department.

2.66 The absence of direct relationship between space provided and work to be done is taken account of in the Departmental Cost Allowances Guide to Areas. For example, if a central kitchen is to be provided for a given number of meals, a kitchen for double that number of meals is not double the size.

2.67 The workflow diagram includes nearly twenty separate processes and some of these are themselves broken down into sub-processes. At the interface between each of these processes some adjustment is possible. Within each of the processes the throughput can be increased or altered by adjustment of the equipment; eg additional ovens can be provided alongside the existing ovens. Changes in the method of ordering stores may enable the same size of store to deal with a greater throughput.

2.68 The ability of a catering department to adapt to changing requirements depends to some extent on the building. It is easier to change the service in a building which is an open space with movable partitions than in a building divided by immovable walls. (2.21) The ability to change service points, and in particular drainage and piped supplies, will also affect the ability of the department to change. In principle, as in most other departments of the hospital, a building which is designed so that the services can be changed, partitions moved, and the department expanded, should be more cost-effective in the long term.

2.69 Where an increase in the workload is required, the situation should be examined carefully and the staff working in the department should be consulted, because they understand the difficulties. An examination of the fabric of the building will show where expansion or alteration is possible. An examination of the operational policies will show whether these may be modified to increase the throughput. An examination of the existing equipment may show that a modern substitute may increase the throughput of that same space. The application of cook/freeze or cook/chill methods in a kitchen can be a means of increasing throughput. An examination of the meal and coffee service in a restaurant may show that it is possible to increase the number of servings within the same space, eg by increasing the number of sittings; or by increasing the length of the meal service time; or by increasing the number of seats in the coffee room.

2.70 Consideration of alternative policies to extend a catering department should include an examination of the following:

a. the existing facilities and organisational patterns

b. the existing space compared with current space standards

c. the existing equipment and spaces allocated to individual functions

d. the opinion of customers and staff where modification may be most effective.

In each case it will be necessary to consider the alternative approaches described in this section. In some cases it may

Figure 17 Expansion and phasing

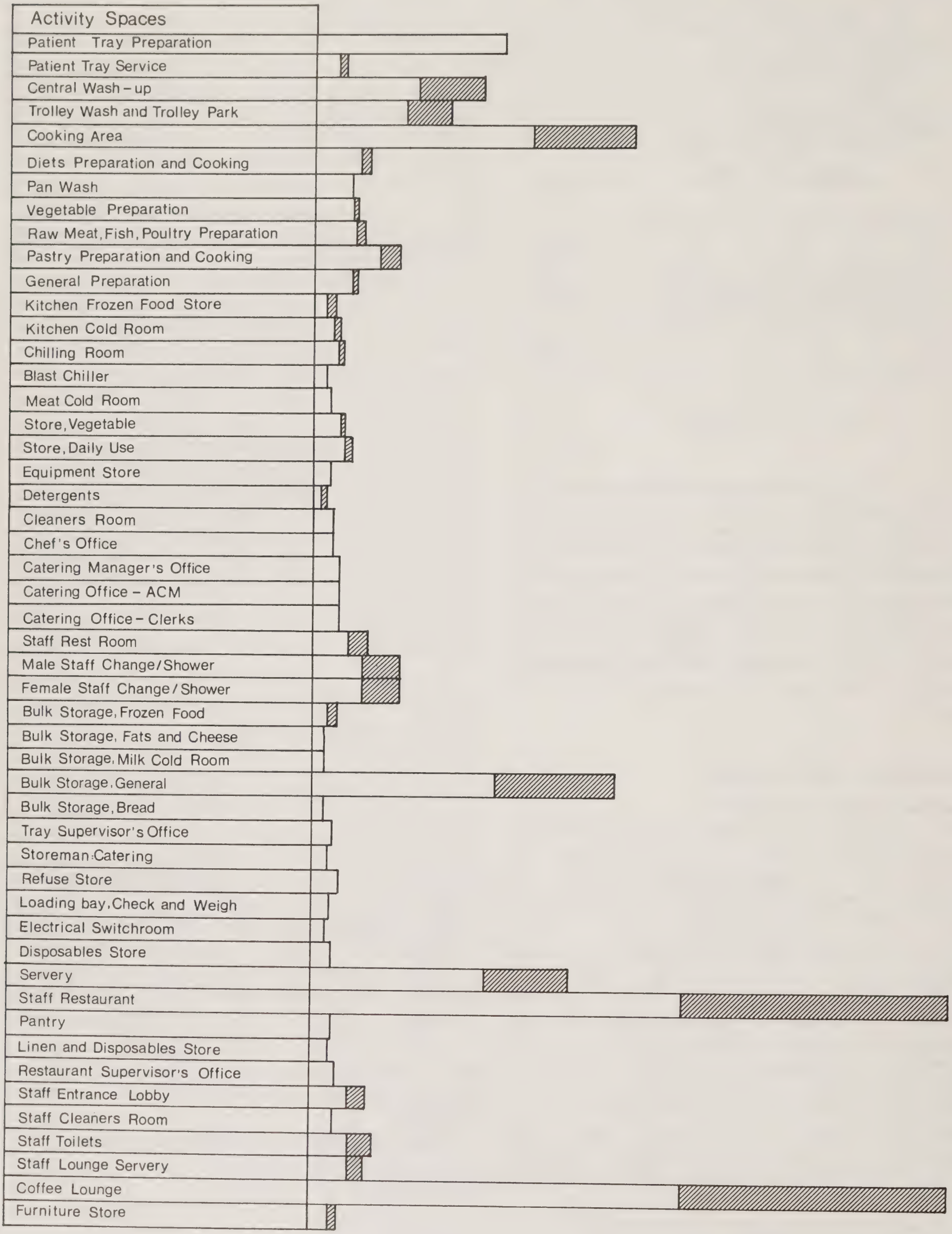


Figure 17 Expansion and phasing (percentage areas)

Activity Spaces	Phase I Percentage	Phase II Percentage	Percentage Growth > 10%
Patient Tray Preparation	0·9	0·7	–
Patient Tray Service	7·0	4·9	–
Central Wash-up	3·9	4·4	63·6
Trolley Wash and Trolley Park	3·4	3·6	55·0
Cooking Area	8·3	8·0	40·0
Diets Preparation and Cooking	1·8	1·5	12·7
Pan Wash	1·4	1·0	–
Vegetable Preparation	1·5	1·1	–
Raw Meat, Fish, Poultry Preparation	1·6	1·3	20·2
Pastry Preparation and Cooking	2·5	2·3	32·3
General Preparation	1·3	1·1	–
Kitchen Frozen Food Store	0·5	0·6	59·2
Kitchen Cold Room	0·7	0·6	17·8
Chilling Room	0·8	0·7	–
Blast Chiller	0·5	0·4	–
Meat Cold Room	0·6	0·4	–
Store, Vegetable	1·0	0·7	–
Store, Daily Use	1·1	1·0	20·5
Equipment Store	0·7	0·5	–
Detergents	0·4	0·4	33·3
Cleaners Room	0·8	0·6	–
Chef's Office	0·7	0·5	–
Catering Manager's Office	1·0	0·7	–
Catering Office-ACM	1·0	0·7	–
Catering Office-Clerks	1·0	0·7	–
Staff Rest Room	1·3	1·5	59·3
Male Staff Change/Shower	1·9	2·3	81·1
Female Staff Change/Shower	1·9	2·3	81·1
Bulk Storage, Frozen Food	0·5	0·6	59·2
Bulk Storage, Fats and Cheese	0·4	0·3	–
Bulk Storage, Milk Cold Room	0·4	0·3	–
Bulk Storage, General	5·3	6·9	80·0
Bulk Storage, Bread	0·3	0·3	–
Tray Supervisor's Office	0·7	0·5	–
Storeman: Catering	0·6	0·4	–
Refuse Store	1·0	0·7	–
Loading Bay, Check and weight	0·4	0·3	–
Electrical Switchroom	0·1	0·1	–
Disposal Store	0·4	0·3	–
Servery	6·1	6·3	49·1
Staff Restaurant	13·2	16·0	71·4
Pantry	0·5	0·3	–
Linen and Disposables Store	0·4	0·3	–
Restaurant Supervisor's Office	0·7	0·5	–
Staff Entrance Lobby	1·4	1·2	–
Staff Cleaners Room	0·8	0·6	–
Staff Toilets	1·6	1·5	40·0
Staff Lounge Servery	1·5	1·4	35·5
Coffee Lounge	13·2	16·0	71·4
Furniture Store	1·0	0·7	–

be possible to increase throughput without an increase in size. Alternatively, it may be necessary to consider increases which result in major modifications.

Phasing of development

2.71 In a new development which will be phased over a lengthy period the early phases must take account of the planned ultimate need. The expansion capability of the catering department should be defined within the phased growth of all other service departments, which may be adjoining it, and within the hospital as a whole. It may be desirable to adopt a principle of designated temporary use of accommodation built in phase one. If so, the temporary uses should be clearly defined as part of a phasing plan. The kitchen itself should not be defined as a temporary use area since it is heavily serviced and difficult and costly to move. The whole of the catering department could be built in phase one, but certain parts of it could be put temporarily to other uses until, in the planned ultimate phase, the catering department would achieve its full planned throughput. When phasing is proposed the quality or range of catering service to the hospital patients and staff is equally important in the early phase as it is in later phases, which may take many years to be completed.

2.72 The expansion diagram (Figure 17) shows the requirement at each phase and the amount of growth required for each part of a catering department growing from 600 meals in phase one to 1200 meals in the planned ultimate size. The diagram translates these figures into a graphically comparable form and expresses each area of the department as a percentage. A comparison between the percentage addition to phase one areas required to meet phase two is significant. This varies from a very small percentage to one hundred per cent for some spaces or doubling in size. The diagram also shows where large areas of growth take place. Many of the smaller areas, eg preparation areas, can be included in phase one, whereas the large areas, eg staff dining, wash-up and trolley park, could have designated temporary uses in phase one. The information on the diagram is the key to understanding how a catering department may expand and to the production of a successful plan for phased growth.

Examples of expansion

2.73 The following examples show how phased growth could take place in certain areas of the catering department as indicated in Figure 17. Attention is given to the relative growth and ease of expansion and the principle of designated temporary use in phase one is adopted.

Expansion of the cooking area

2.74 There are a number of obvious problems entailed in the expansion of a cooking area. Anything which disrupts the cooking operation is inconvenient. Regular production of meals for patients and hospital staff is vital to the running of the hospital. Total shutdown of the cooking operation is usually not possible and even partial shutdown is undesirable. A method of expansion is therefore required which permits the continuous operation of the cooking area.

2.75 Modification or extension to the building fabric can cause a great deal of dust and dirt especially when solid walls or ceiling need to be demolished. This may be necessary if the cooking space has to be increased in size to accommodate expansion. It could be avoided if the planning of the cooking area provides for its expansion into adjoining spaces without the need for demolition of solid walls.

2.76 One of the most difficult operations in expanding a cooking area is the extension of the services to supply extra equipment. This could involve a shutdown of large sections of the cooking area during engineering works. The cooking equipment should be arranged in sections which are separately connected to mains and separately switched so that any section can be turned off while the others are left in operation.

2.77 The possible methods of expansion illustrated in Figure 18 show a cooking area with equipment arranged along three spines in the ultimate size. In the first phase of development the equipment could be accommodated on two of the spines. Space must be provided along the spine behind the equipment for access for cleaning and maintenance. (2.62) This arrangement allows the easy removal and replacement of items of equipment, which could be separately valved or connected to the services in the spine. The whole spine need not be shut down for the replacement of any one item of equipment.

Total space provided in phase one

2.78 Three spines of services would be constructed in the early phase. The equipment required in that phase would be connected and located in position for the final layout. The whole cooking area would thus be underutilised during the first phase with a consequent economic penalty. The advantage of this approach is that there would be minimal disruption for expansion to the later phase when the additional equipment would be located in the spaces already provided. No building or service extension would be necessary.

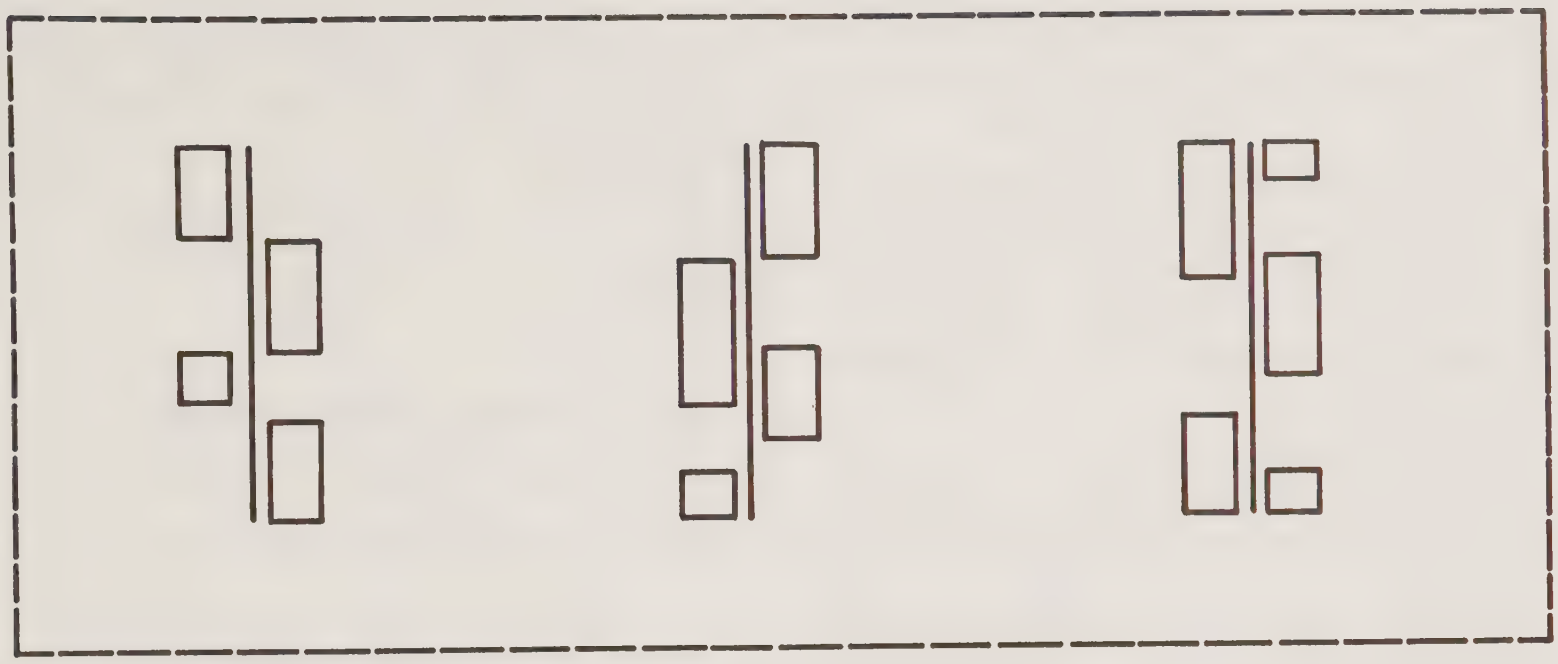
Growth in phase two (a)

2.79 The total space would be constructed in the early phase and the main connections to the service spines would be installed. Two of the spines would be fully installed and the equipment required in phase one would be connected to them. The third spine would not be constructed at this stage. This would permit one third of the cooking space to be made available for a temporary use during the first phase. It could, for example, be partitioned with easily removable partitions and used for kitchen storage space. At the time of expansion to phase two the partitions would be dismantled, the third spine would be connected to the main services already positioned, and the equipment would be rearranged around all three spines to suit the final layout. This provides an economic solution in phase one and avoids major disruption due to building or engineering works to achieve phase two.

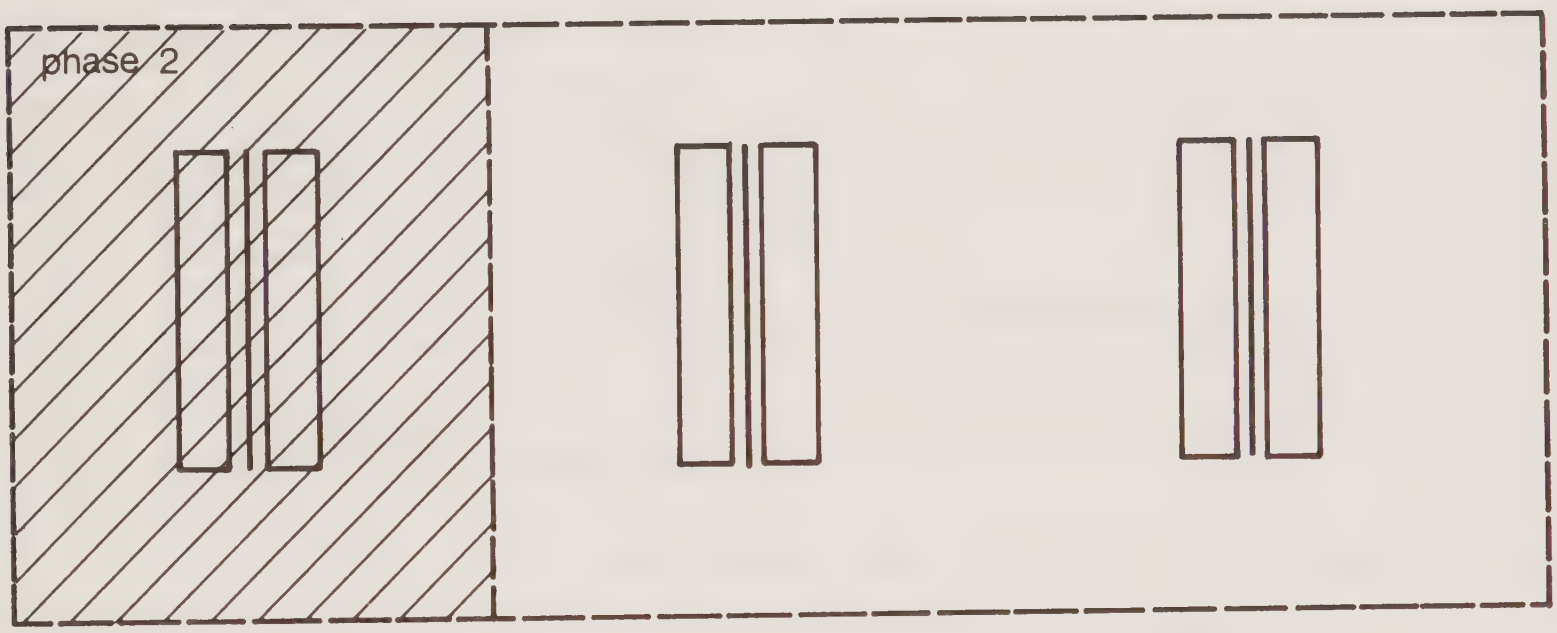
Growth in phase two (b)

2.80 Three short spines would be installed in phase one and each spine would be increased in length in phase two. The spine for temporary use in phase one is not a useful shape. Each spine would be disrupted at phase two. This contains the disadvantages of (a) without its advantages.

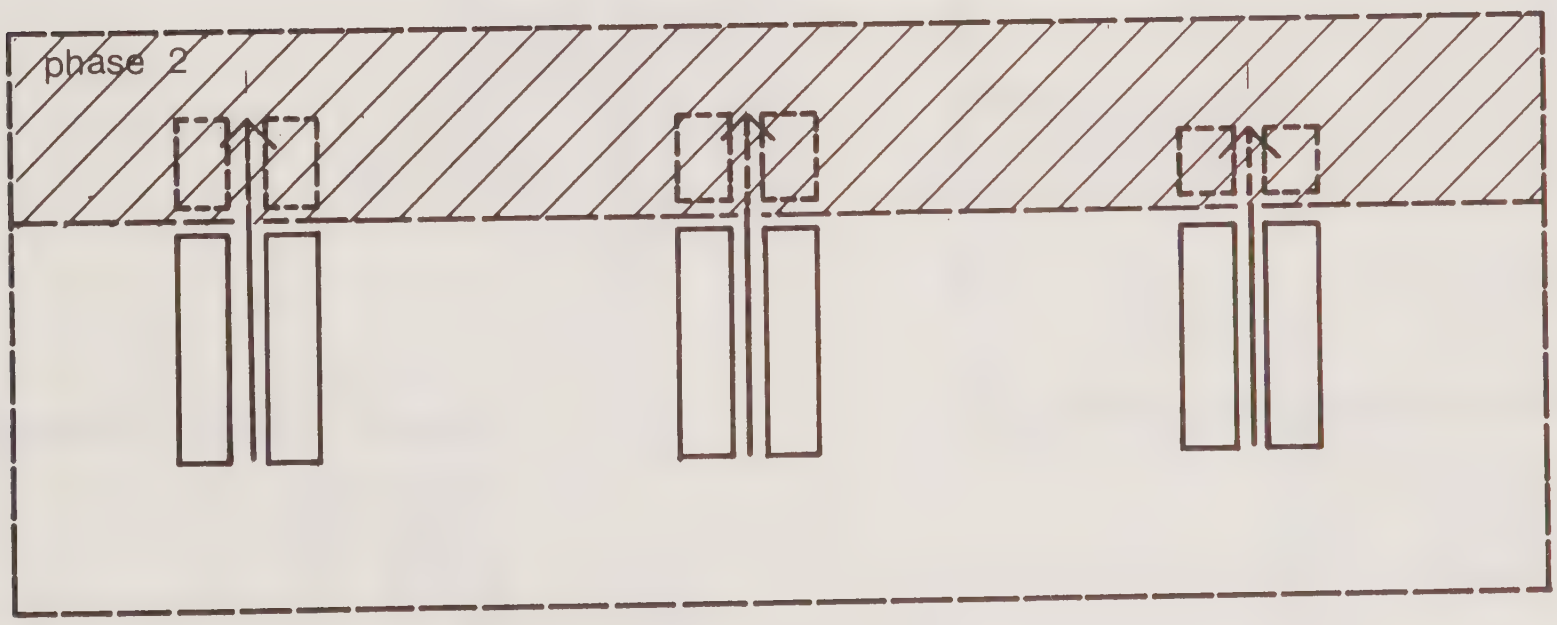
Figure 18 Expansion of cooking area



1 Total space provided in phase I



2 Growth in phase II (a)



3 Growth in phase II (b)

Expansion of the wash-up and trolley parking areas

2.81 In the final phase, two tunnel washing up machines are required compared with one in the early phase, and, twenty trolleys need to be parked, only half of which are required in the early phase. These two factors could release a considerable amount of space to accommodate temporary uses in the early phase, assuming that the total amount of space was constructed. Figure 19 shows how the space could be allocated in the two phases.

2.82 In the early phase the space for one tunnel washer would be partitioned from the wash space using demountable partitions. This space is large enough for the parking of all the trolleys required in the early phase. The whole of the final trolley parking space would therefore be available for other temporary uses.

The staff rest room and storage including the equipment store could temporarily be located here. All partitioning could be demountable to avoid dirt and dust at phase two.

2.83 When expansion to phase two is required the temporary uses would be removed to their final location (see Figure 22 phasing stages of growth). The demountable partitions would be removed. Trolley parking would be removed to its final location at the end of the patients' tray service space without further construction or engineering works. The demountable partition along one side of the central wash-up would be removed and relocated to allow space in the central wash-up for the installation of the second tunnel washer. During this process, the central wash-up would be in operation as would also the patients' tray service conveyor belt.

Expansion of dining room and coffee lounge

2.84 The final area of the coffee lounge which is approximately half of the total restaurant area, could be made available for alternative use by another department during

Figure 19 Expansion of wash-up and trolley park

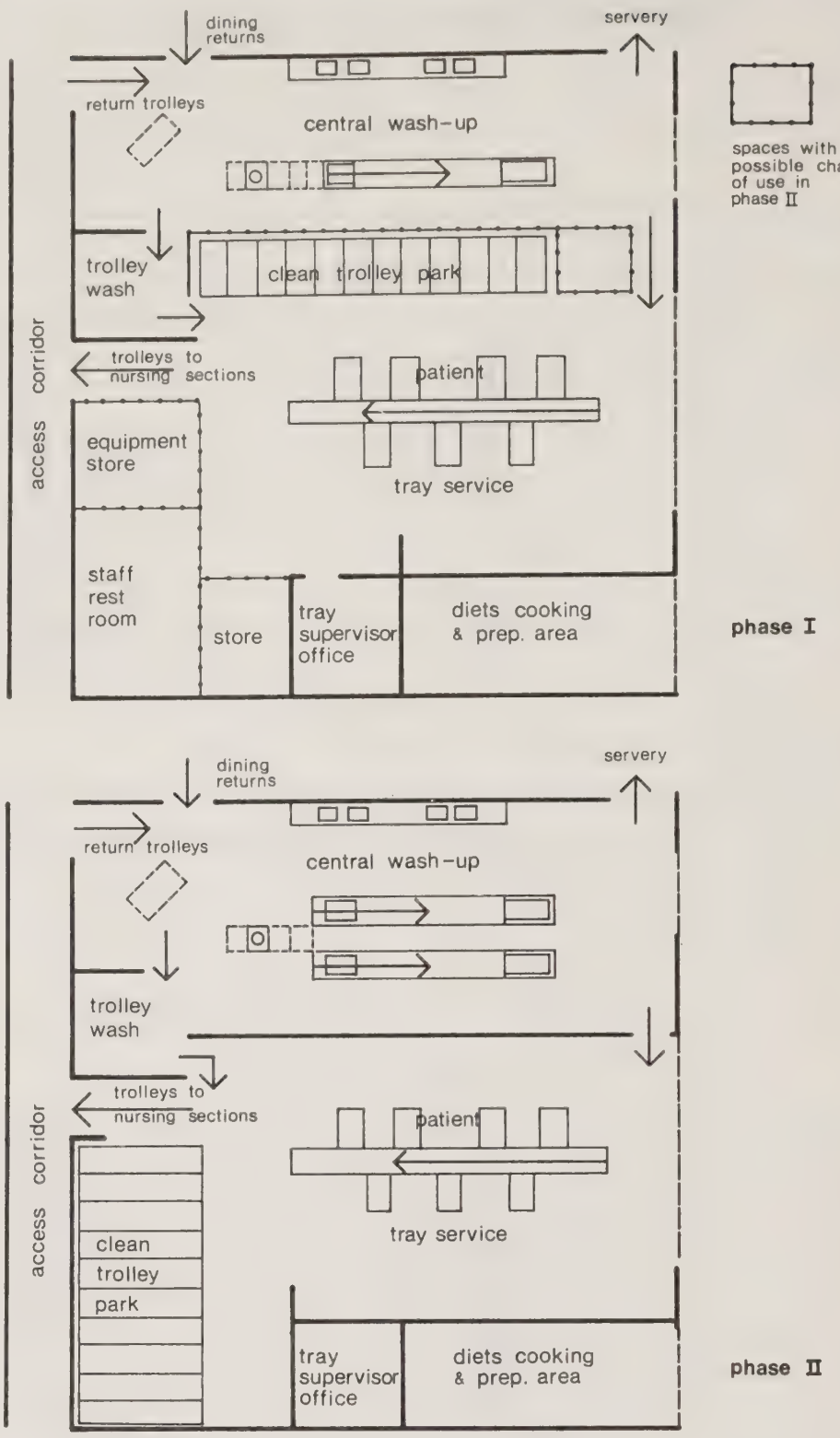
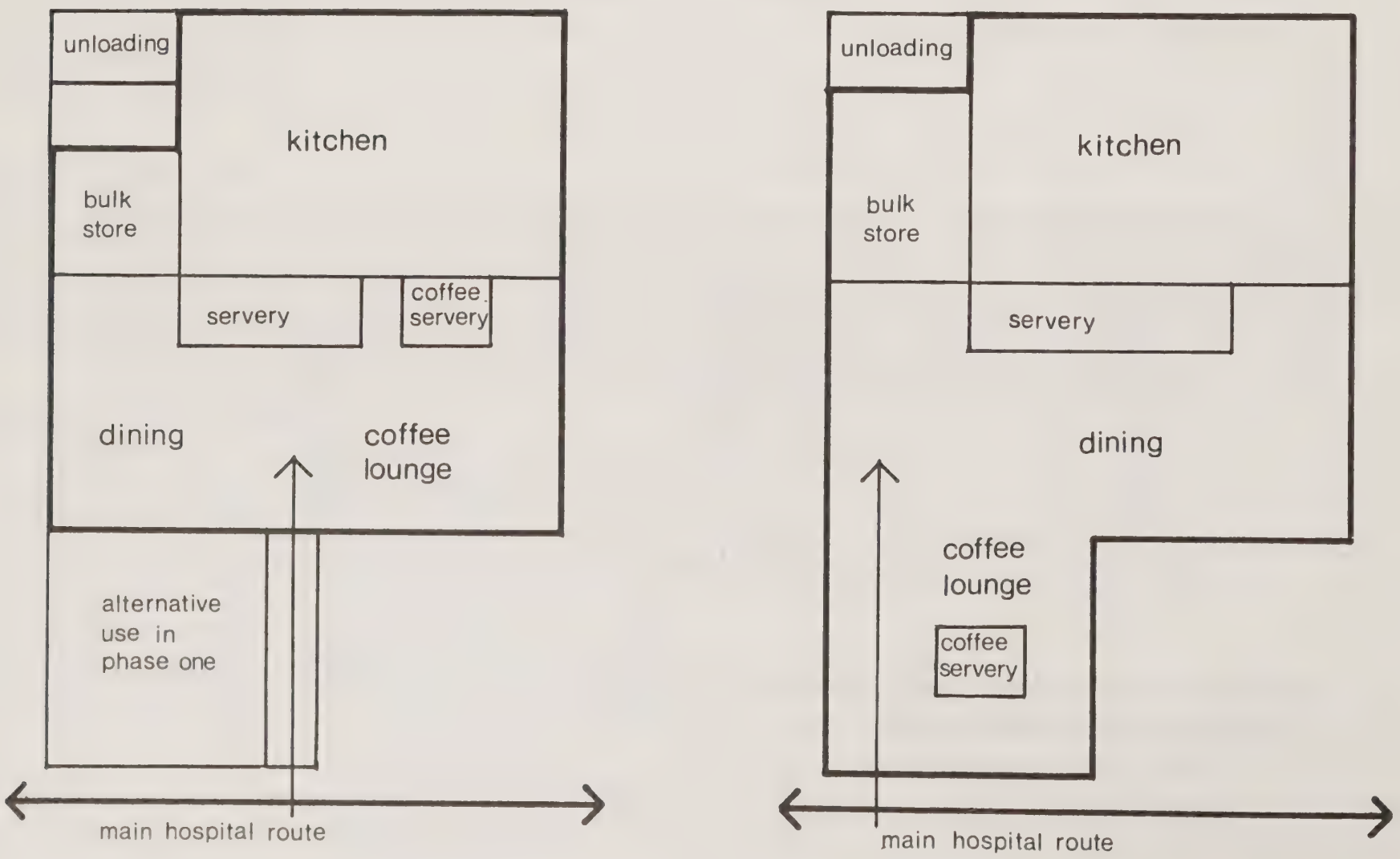


Figure 20 Expansion of dining room and coffee lounge



phase one. The main servery would include the coffee lounge servery during the early phase. For phase two the coffee lounge area would be taken over, decorated and the separate servery installed. The main servery could then be extended to its full capacity for meals.

Worked example of phasing

2.85 The examples of expansion given above are practical but need to be worked out in detail to suit any project solution. Such isolated examples need to be integrated into a complete plan for the phased growth of the department. This would depend upon the careful staging of construction so that work could proceed in discrete areas without major disruption to the continuous operation of the whole department. The following example shows a notional plan (Figure 21) with the four stages of construction through which it would proceed (Figure 22) from phase one comprising 3 stages to a final fourth stage in phase two in which its capacity is doubled.

Figure 21 Phasing – worked example

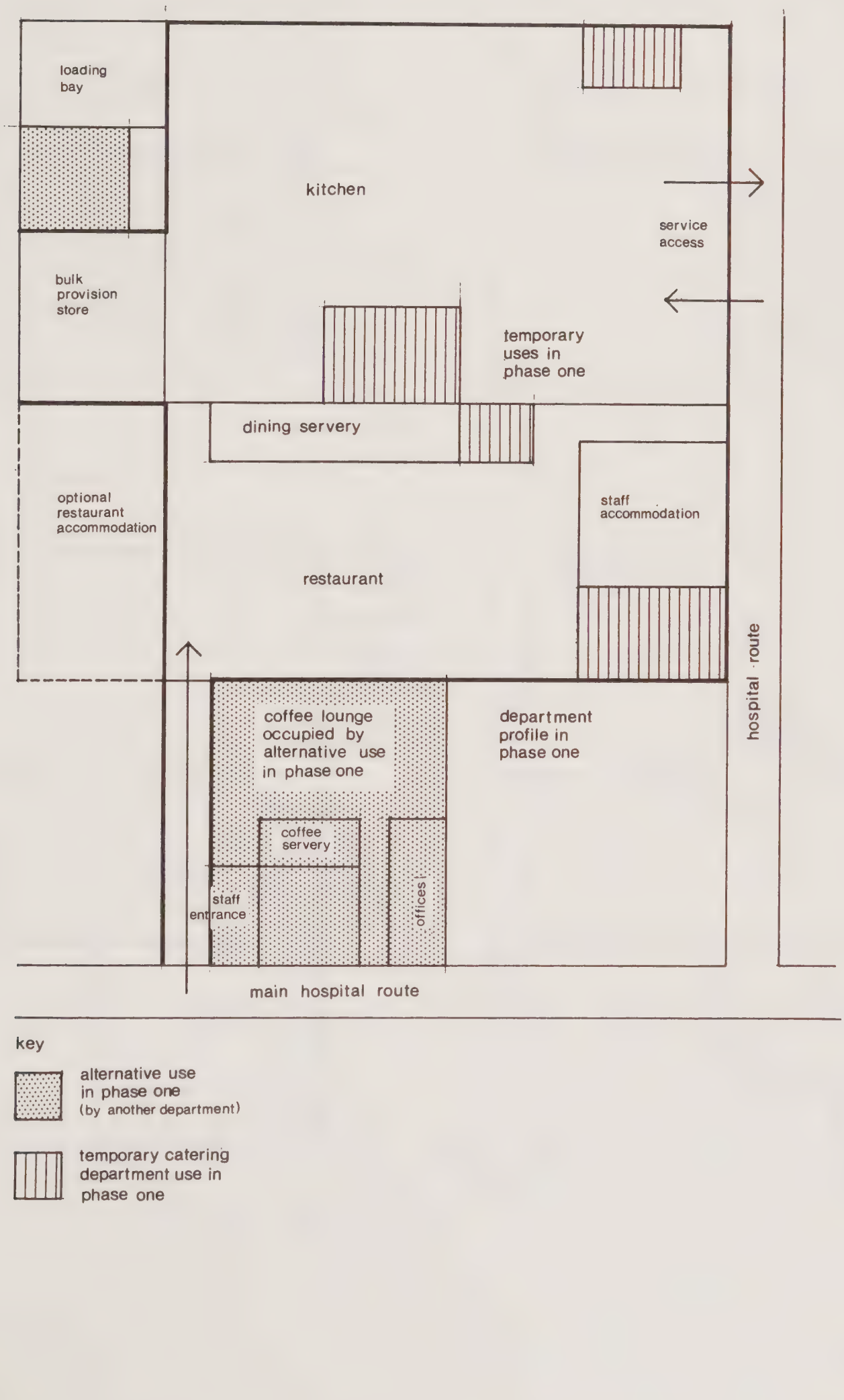


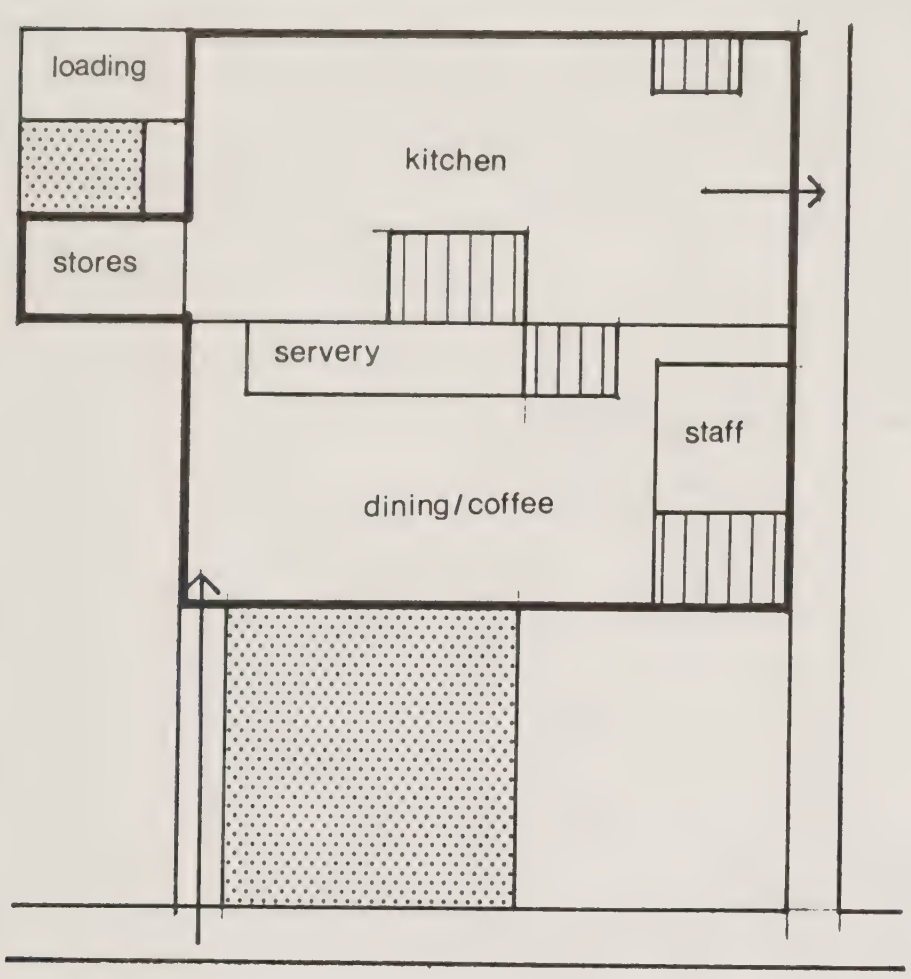
Figure 22 Stages of phasing

key

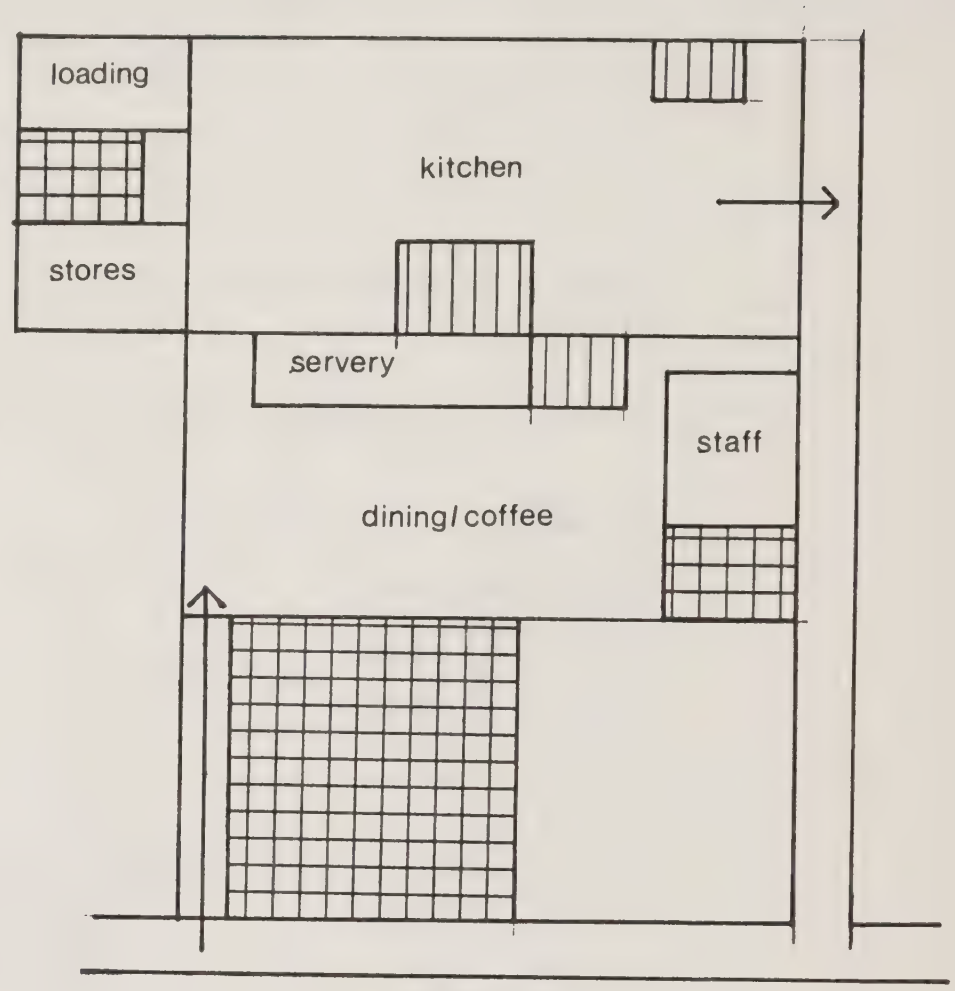
temporary use

alternative use

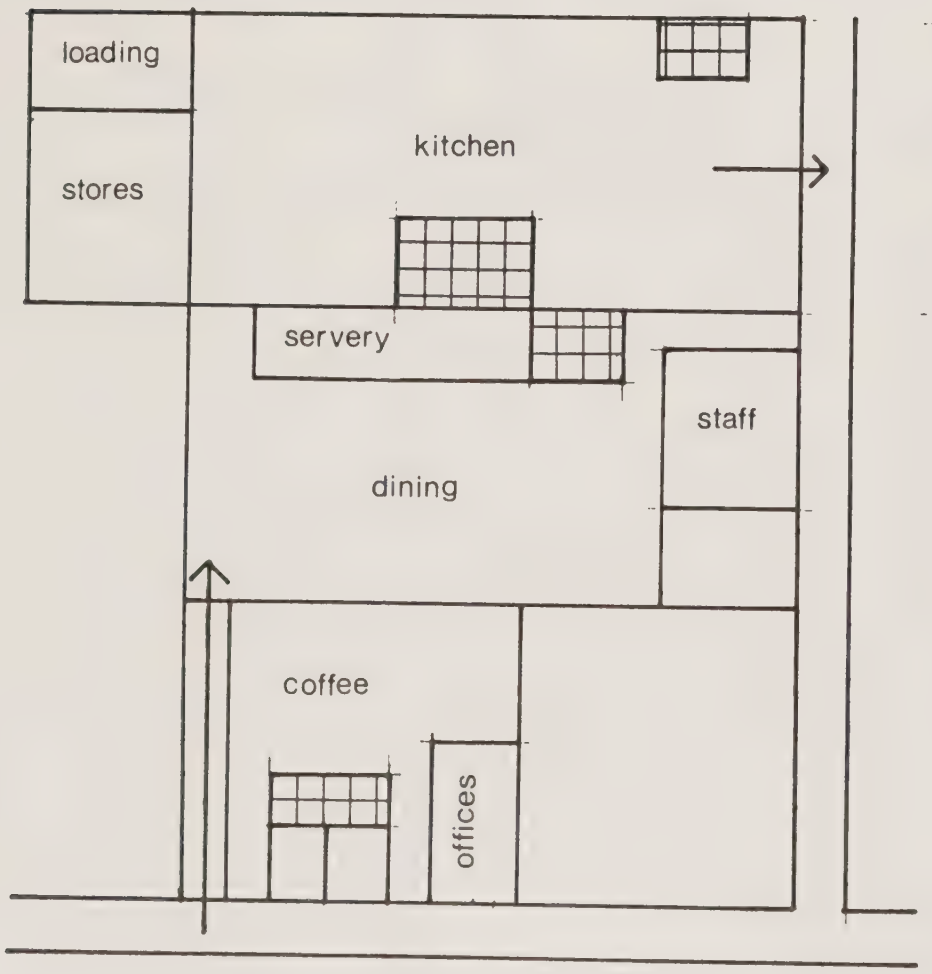
work in progress



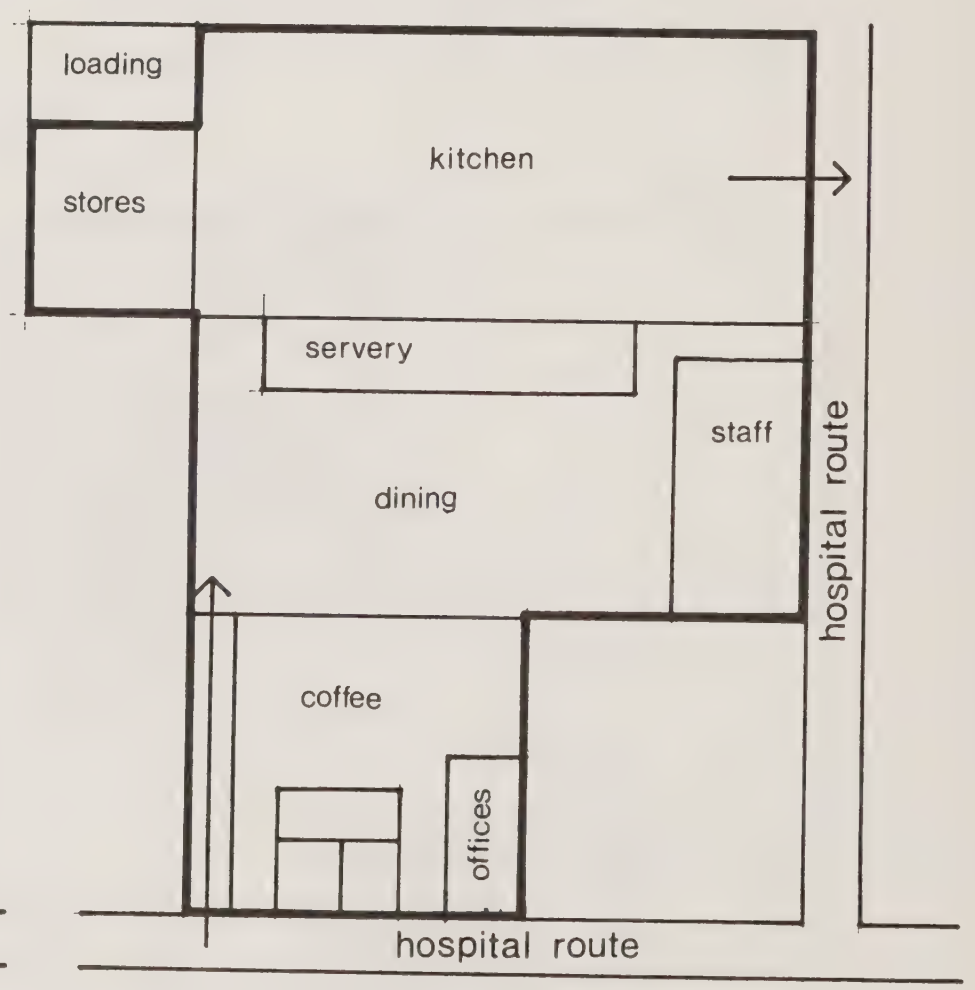
a. phase one
stage one



b. —
stage two



c. —
stage three



d. completed phase two
stage four

Phase one (Stage one)

2.86 In phase one the kitchen would provide the number of meals required in that phase. The overall area provided would be that for the ultimate size but part of it would contain temporary uses as shown in Figure 22 a and b. A large part of the dining room would be allocated to alternative use by another hospital department as in Figure 22c. Part of the storage space would be used by other departments. The servery would supply meals and coffee to the combined restaurant and coffee lounge. These circumstances would prevail for the phased period (through stages one, two and three) until the growth of the hospital justified the expansion of the catering department into its ultimate size.

2.87 Stages two and three are planned constructional stages which should be executed as rapidly and conveniently as possible. They should be completed in time to meet the ultimate anticipated demand for meals from the kitchen as the hospital expands. This is probably the minimum number of stages possible: the actual number of stages will depend upon particular planning solutions but the number of constructional stages and the disruption of the work of the kitchen should be kept to a minimum.

Phase one (Stage two)

2.88 The kitchen and restaurant continue to operate for phase one needs. Work proceeds in the coffee lounge area to prepare it for phase two. Alternative users during phase one would be required to vacate this space and move to their phase two location at this stage. Part of the bulk store is also prepared for phase two occupation by the catering department. The final location of the staff rest room is taken over and prepared for phase two. Offices are relocated adjacent to the coffee lounge.

Phase one (Stage three)

2.89 The work carried out in stage two would release space for work in this stage. Temporary uses would be removed from the kitchen storage to the bulk provision store, and staff rest room and offices to their final location. The third cooking spine would be installed in the kitchen and equipment arranged for phase two. Coffee lounge servery equipment would be removed from the main servery to the coffee lounge servery. At this point the coffee lounge could become usable.

Phase two (Stage four)

2.90 The main servery would be fully equipped and the total restaurant including dining room and coffee lounge become fully operational. The fully equipped kitchen moves into full production for phase two.

3 Functional requirements

3.1 This chapter provides guidance on the functional requirements and design implications for each of the activity spaces within the catering department.

BULK STORAGE

Loading bay

3.2 The loading bay which is normally provided for the general delivery of all goods to the hospital will also be used by the catering department. Suitable protection against the elements and manoeuvring space for goods vehicles is required. The bay should have direct access to the bulk provision store and its associated cold rooms which should be on the same floor level to facilitate the use of trucks and pallets, and a hose reel and drain for washing down daily and after spillages etc.

Check and weigh

3.3 Scales for checking incoming goods will be required.

Storekeeper's office

3.4 The storekeeper will need office facilities associated with the loading bay, either within a general office or separately.

Empties store

3.5 A secure store for returnable charged containers and pallets.

Refuse store

3.6 The allocation of space for food waste, refuse and returnable containers will depend on local policy. The store should be separate from the loading bay to prevent cross-contamination. Bins for food waste should be stored on racks; the number of bins will depend on whether or not disposal units are used. The area should be under cover, well ventilated and easily cleaned by use of a hose. The use of a compactor is recommended to reduce the volume of refuse. If the refuse store is not adjacent to the kitchen it may be necessary to provide a holding space for refuse close to the kitchen.

Bulk provision and refrigerated stores

3.7 Storage for central or local bulk provisions will depend on local policy and should be discussed with the appropriate supplies organisation at an early planning stage. Storage is required for dry provisions and for catering disposables and refrigerated foods. The main space should be provided with mobile racking and pallets. The bacon slicing machine may be sited here or in the kitchen depending on local policy. Some perishables like meat, wet fish and vegetables may be transferred direct to the kitchen. Space is required for filling and holding ward containers. A lockable cupboard will be needed for expensive items eg spirits.

Bulk storage—bread

3.8 A separate ventilated store may be required for bread.

Bulk cold stores

3.9 Cold storage is required for items like bacon, fats, milk and dairy products and a deep freeze for frozen foods. These stores may be built integrally within the overall structure or assembled from pre-fabricated parts. Level, hardwearing and easy to clean floors and walls are required, and mobile stainless steel racking is recommended. The following refrigerated stores are required.

Bulk storage—fats and cheese

3.10 For storing dairy products, excluding milk and cream, at a temperature not exceeding 5°C.

Bulk storage—milk cold room

3.11 For storing fresh milk both in bottles and bulk packs and cream at a temperature range of 1°C to 4°C.

Bulk storage—frozen food

3.12 For storing frozen food including meat at a temperature not exceeding minus 22°C.

KITCHEN

Storage spaces

3.13 Spaces are required in the kitchen for the separate and secure storage of perishable items of foods, equipment and disposable items. There should be sufficient capacity to cover extended public holidays. Stores must be insect and rodent-proof. These spaces should be provided with mobile racks and working surfaces of stainless steel. Cold stores providing varying temperatures may be structurally integrated or assembled from prefabricated parts. They should be fitted with safety alarm systems both for the event of a substantial rise in temperature, and for the safety of staff trapped inside. The following paragraphs describe each storage space which should be directly associated with its relevant preparation space.

Kitchen refrigerated stores

Vegetable store

3.14 A store is required for fresh and ready prepared vegetables and fruit at a temperature not exceeding 7°C. This store should be sited near to the delivery bays with a door at one end for deliveries and a door at the other end giving direct access to the vegetable preparation area. (3.29) Allowance should be made for the movement and parking of the mobile racks and trucks. Boxes and sacks of vegetables should be stored on pallets or mobile racks.

Meat cold room

3.15 A room adjacent to the raw meat preparation area is required for the storage of raw meat and poultry which may be frozen, chilled or fresh. In addition to the mobile racks some hanging rails may be needed. The optimum storage temperature for fresh meat is between minus 1°C and plus 1°C.

Chilled food store

3.16 A room adjacent to the kitchen cold room, is required for the storage of foods which have been cooked and must be chilled as rapidly as possible prior to refrigeration, eg roast joints of meat and poultry. The room should have a temperature of approximately 7°C or less. Insulation is needed to minimise condensation and the walls may be tiled. While good lighting is essential the room is not designed as a working area. The general preparation space may be sited close to this room and the blast chilling bay.

Blast chilling bay

3.17 A space is required for a purpose built refrigeration unit known as a rapid blast chiller. The reason for rapid chilling is to prevent the growth of potentially harmful organisms. These units are made in a variety of sizes and are specifically intended for cook/chill catering operations. They are designed with rapid air movement and air temperature in the range 0°C to 5°C to give very rapid chilling.

Kitchen cold room

3.18 This room is for the storage of cooked and prepared foods only. Raw meats, fish, or poultry should not be stored here. The room should be located between the chilling room and the deep freeze with access to both and should be sited close to the main cooking area. The cold room temperatures should be between 1°C and 3°C.

Kitchen frozen food store

3.19 A store is required for frozen foods. It should be large enough to hold emergency stocks and day to day requirements. The store should be located adjacent to the kitchen chilling room and kitchen cold room, with access through either of these in order to maintain a constant temperature, which should not exceed minus 22°C.

Store-daily use

3.20 This store is for dry provisions requisitioned daily from the bulk provision store. It may also be used as an ingredient control room for weighing and assembling the ingredients needed for specific recipes. The store should be sited so that provisions can be delivered without passing through the main cooking space and convenient for the pastry preparation and main cooking spaces. A secure dry ventilated environment is required. Refrigerators and deep-freezers should not be sited in this space.

Equipment store

3.21 A store is required for dishes and utensils not in daily use; it can be located on the periphery of the department.

Catering disposables

3.22 A dry store is required for disposables including plates, cups, trifle cases and paper serviettes.

Food preparation spaces

3.23 Raw foods like meat, fish and poultry must always be prepared separately from cooked foods to avoid cross-contamination. Where possible, each preparation space should be adjacent to its appropriate store to minimise the traffic of dirty vegetables or raw meat through the cooking area. A handbasin will be required in each space to minimise cross contamination. Each preparation space is described below.

3.24 Worktops, tables, sink units and hand basins should be of stainless steel with legs and under shelves of non-rusting material. Where machines with a reciprocating motion are used, worktops should be strengthened. Sink units should be positioned away from walls to facilitate cleaning the wall and the rear of the unit. The shelving should be removable for cleaning. The lowest shelf should be positioned a suitable space above the floor to facilitate cleaning. Wherever practicable these items should be mobile to allow the areas where they are used to be thoroughly cleaned; alternatively, the fewer legs and supports the better, and the open ends of any hollow sections must be sealed. The wheels of mobile work tops and tables should be lockable to prevent accidents.

3.25 Stainless steel racking is recommended for use in all food spaces. These racks should be mobile with adjustable shelves and of standard dimensions so that they can be easily manoeuvred and interchanged.

3.26 Trolleys used in the department should be made from stainless steel and be of a standard size capable of taking gastronorm size containers. They should have large wheels, two of which should be lockable, and buffer rails at the same height as the wall buffering to minimise damage. Space should be provided for the safe parking of trolleys and other mobile equipment, when not in use.

3.27 Refrigerators and deep freeze cabinets should be placed in a well ventilated situation where the ambient temperature does not exceed 80°F. A clear space is required around the cabinet to allow the door to open safely, and for cleaning and maintenance. Mobile models are preferred.

3.28 Food preparation machines should be well-designed to facilitate operation and the subsequent dismantling for cleaning, in safety. Bench mounted models should have specially strengthened benches. Cutting attachments should be kept in a dry, ventilated cupboard within safe reach of the operator. Slicing machines for general use will be of the gravity feed type; bacon slicing will require a flat bed machine.

Preparation of vegetables (including salads and fruits)

3.29 This space should be located between the vegetable store and the cooking space with access to both. The equipment needed for washing, cleaning, cutting of vegetables and fruits will vary according to the number of meals, the amount of pre-prepared vegetables purchased and other local policies. The paring machine should be sited close to the vegetable store to minimise handling. The machine should be at suitable height for both loading the vegetables, and discharging them into a shallow sink at a working height for finishing. Deeper sinks are used for

storage and mobile sinks for transfer to the cooking space. Wall mounted taps for filling and a floor drain will be required for emptying the mobile sinks.

Preparation of raw meat/fish/poultry

3.30 A separate worktop and sink is required for each of these items. Fish should be stored in a purpose-built refrigerated cabinet adjacent to the fish preparation sink. The raw meat cold store should open into this space.

General preparation

3.31 A space, sited near to the kitchen cold room and blast chiller, is required for the preparation of cooked meats, salads, sandwiches and similar foods. Worktop space is required for the preparation of these items. A refrigerator is required for the storage of sandwich fillings.

Pastry—preparation and cooking

3.32 This space is for the preparation and cooking of all pastry and confectionary items. Depending on the size of the kitchen, this space may be sited adjacent to the main cooking space or be a self-contained space with its own cooking equipment.

Diets—preparation and cooking

3.33 A space, sited adjacent to the patients' tray service space, is required for the preparation and cooking of individual diets which cannot be incorporated in the selective menus provided for patients. Space is required for secure storage of dietary foods.

Cooking area

3.34 This area is for the cooking of food for patients, staff and visitors and for any meals which may be required for community services. It should be planned to ensure a good work flow from the adjacent preparation bays through to the appropriate cooking equipment and to the patients' tray service and staff restaurant servery. Cross circulation should be avoided. Space between each group of equipment should be sufficient for staff to operate the equipment safely and to allow others to pass without hazard.

Services

3.35 Ideally, fixed equipment should be arranged in island groupings with a central spine for services. The installation needs to allow access on all sides for cleaning and maintenance. Whenever possible, service entry holes must be made pest and waterproof. Pipe and cable runs should be neat. Insulation where used to cover pipes should be of a material that can be easily cleaned, is impervious to water, and sealed to prevent the harbouring of insects and pests. These services should be able to withstand frequent cleaning. Service chambers should be easily accessible for inspection and maintenance. Boiling pans and similar equipment should be placed so that the contents may be discharged directly into a drain or gully. To prevent splashing a tundish or funnel may be used to direct the water into the gully, the cover of which should be specially designed for ease of removal and cleaning. Stainless steel work tables and racking located adjacent to cooking equipment should be mobile for ease of access for cleaning and maintenance. Positioning should be such that when services need to be replaced or repaired they can be carried out with the minimum disruption to the production schedule.

Equipment

3.36 The equipment chosen should be reliable, safe to operate, and comply with BSI standards and, where appropriate, should be British Gas Council or British Electricity Authorities Bureau (BEAB) approved. Operating instructions should be in full view and associated switch gear clearly indicated. Safety interlocking devices and gauges should be provided where appropriate. Whenever practicable, floor-standing equipment should be mobile to facilitate cleaning and maintenance. Access panels should be easily removable for maintenance but secure and close fitting to avoid infestation. The cooking and service equipment chosen should be designed to take the BSI standard metric food containers (BS 4874) and should be capable of heavy duty use for long periods. Cooking equipment finishes should be durable and easy to clean; a stainless steel finish has been found to be the most satisfactory and provides a uniform appearance. Designs which have ledges and crevices which harbour grease and dirt should be avoided. Planning should be flexible in order to accommodate changes in equipment which quickly become outdated. The basic criteria for the selection of equipment are:

a. performance, including the quality of food produced, the output in terms of number of portions an hour, and efficiency in the use of energy

b. cost, including running costs, installation costs and anticipated life-span

c. safety and hygiene, including ease of access for inspection and cleaning

d. appearance and design, including space requirements and ease of use

e. flexibility of use.

As the selection of equipment will influence the design of the engineering services an evaluation of the output of the kitchen, ie maximum quality and the type of food produced, should show which equipment is likely to be the most frequently used.

3.37 Some heavy equipment is mounted on legs which facilitate the cleaning of the underside. This equipment may be moved by using pallet trucks. Other equipment may be mounted on rollers with flexible armoured supply connections.

3.38 Cooking equipment manufacturers often produce equipment that is designed to be bolted together in groups. These groups or banks of equipment are called modular units. They occupy less floor space than free-standing units and have the same external finish and design. The disadvantages are that few manufacturers use the same modular dimensions. A planner may wish to use one manufacturer's oven and another's fryers, and these may not be compatible. Designs vary from year to year so that it is often difficult to obtain replacements. The services may be concealed behind a cladding which makes cleaning and maintenance difficult. Internal spaces may become breeding grounds for pests, and a whole suite of equipment may have to be put out of action in order to remove one defective item. While individual units may occupy more space the advantages are that they are easier to clean and maintain, and it is less disruptive to the

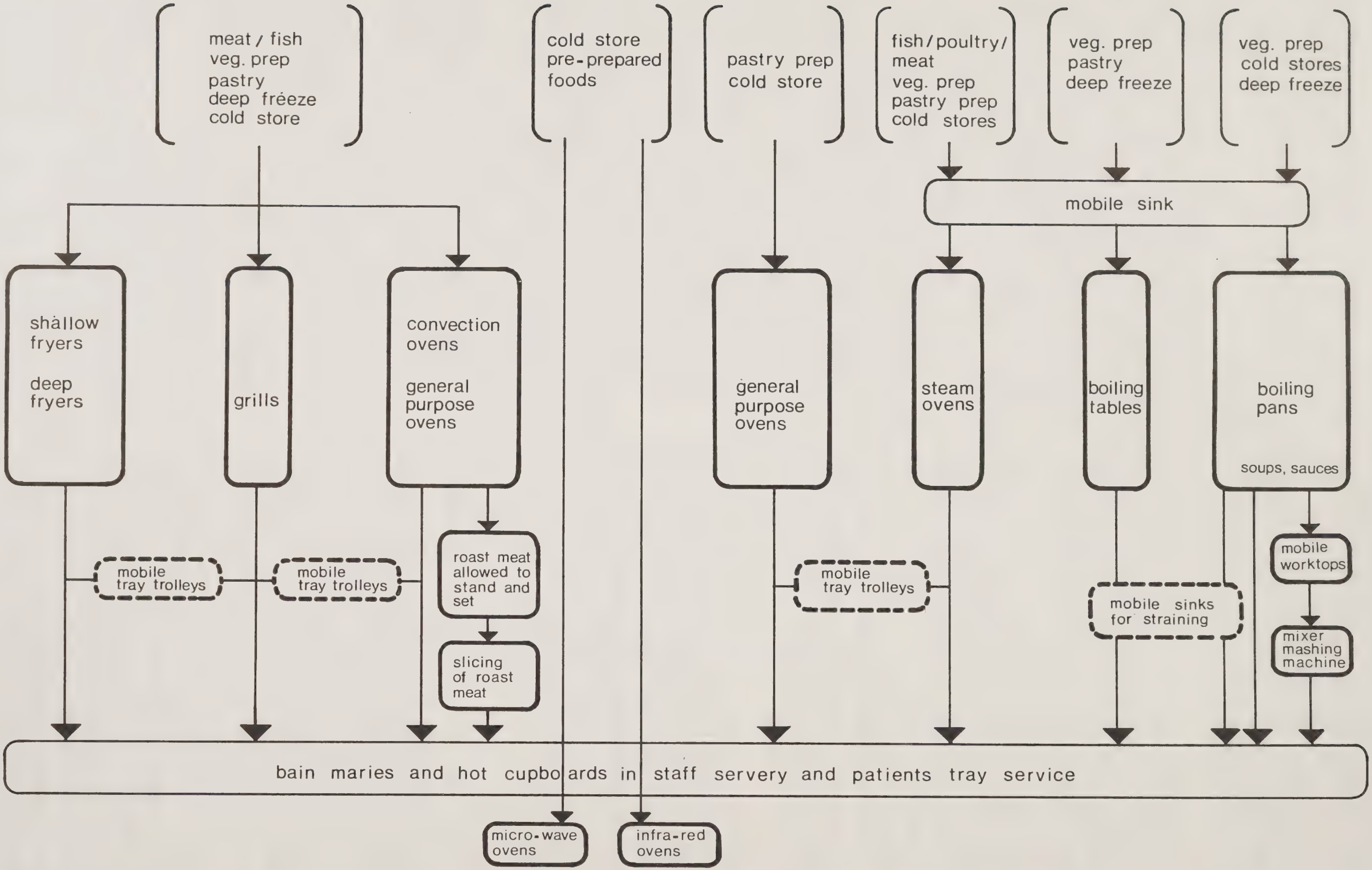


Figure 23 Workflow: cooking

kitchen when a single unit has to be removed. Where fixed cooking equipment has to be located against the wall the installation should leave adequate space for cleaning on all sides. Equipment may be mounted on plinths but these are only extensions of the floor level and do not facilitate cleaning or maintenance. Plinths may raise working heights above a safe level and restrict the subsequent rearrangement of equipment.

3.39 The island groups referred to in paragraph 2.62 will comprise the items described in the following paragraphs. These may be arranged in three groups viz: Wet; Dry; and Frying. The 'wet' group consists of boiling pans and steaming ovens; this group should be provided with its own water supply and drainage. The 'dry' group consists of ovens and ranges; and the 'frying' group of grills and bratt pans. All the equipment described may be gas or electrically heated, but the 'wet' group may also be steam heated.

Boiling pans

3.40 At present most boiling pans are steam-heated although gas and electrical models are available. The food is cooked indirectly by a steam or hot water jacket around the outside of the stainless steel pan. There are two types available with either fixed or tilting pans. The fixed pans are emptied by a tap. The tilting pans can be moved and the contents poured out. Swivelling water taps are required to fill these pans. Outlets should be positioned over the gulley for ease of emptying.

Steaming ovens

3.41 Steaming ovens may be of the atmospheric or pressure type and are used for cooking vegetables, meats and puddings. Most are steam heated but there are also gas and electric models. The pressure types should be fitted with safety interlocking pressure release devices which prevent staff scalding themselves when opening the chamber. These ovens may require interceptor grease traps and condensate drainage. These ovens are gradually being replaced or complemented by high speed steamers, which are more efficient in energy consumption and time.

Ovens and ranges

3.42 These are used for roasting and baking. An oven may be combined with a solid or open burner boiling top or table to form a range. Large cabinet type roasting ovens may also be required.

3.43 The convection oven uses an electrically driven fan to force the hot air around the cooking chamber. It can be used for roasting and baking and, preferably, should be single-tiered with a wheel-in rack to minimise handling. Glass door panels are available, but can present a cleaning problem. The doors should be fitted with a cut-out switch to stop the fan when the door is opened. Pastry departments may require a multi-tiered pastry oven with independent controls for each tier. The top tier should be at a reasonable height to enable the operator to unload it safely.

Fryers

3.44 Precautionary measures against the risks associated with deep-fat fryers are dealt with in the document referred to in paragraph 1.58. Deep-fat fryers should be fitted with an additional overriding thermostat, and a fire blanket should be provided at a convenient point and staff instructed in its use. Fryers should have a cool zone where sediment can collect without charring, and be fitted with a drain cock for emptying, the pan should be integral with the hob.

3.45 Shallow fryers or bratt pans may have fixed or tilting pans made of stainless steel or cast iron. They are not designed for deep frying. These fryers should be supplied with hinged lids or covers made of stainless steel.

3.46 Canopies over fryers must be of non-combustable material and should be fitted with removable grease filters in addition to fire safety devices. Stainless steel canopies and filters are recommended.

3.47 In smaller installations it is important that adequate space or more physical barrier exists between a fryer and other equipment, eg a boiling top, so as to prevent fat or oil being splashed from the fryer or of utensils being pushed into it.

Grills and salamanders

3.48 These are used for grilling, toasting and browning foods and they can be mounted on a stand or over a work top. They should not be positioned above other equipment which may give off heat. The heat source for a grill is usually below, whereas the heat source for salamanders is above. Fast heating elements are recommended.

Microwave ovens

3.49 These are principally used for the rapid reheating of pre-cooked foods. They may be combined with refrigerated food vending machines for staff service. They are suitable as back-bar cooking equipment in a staff restaurant or peripheral kitchen serving patients. It is essential that these ovens are regularly checked to ensure that radiation leakage cannot occur. They should conform to BSI Standards BS 3456 and BS 5175.

Hot cupboards and bains marie

3.50 These are for the storage of cooked foods prior to serving. The open bath or bain-marie of water is used to keep pans of food hot until required. A tap is required for filling the bain-marie. Dry heat models are also available.

Pan wash

3.51 This space is for the disposal of food waste, rinsing washing-up and drying of pans, utensils and equipment used in the kitchen. It should be located adjacent to the cooking space and near to the restaurant servery. Walls will require special protection. (2.23) Duck-boards may be needed on the floor in front of the sink for the operator. In large units a pan-washing machine may also be required; it will need sufficient space for loading and unloading.

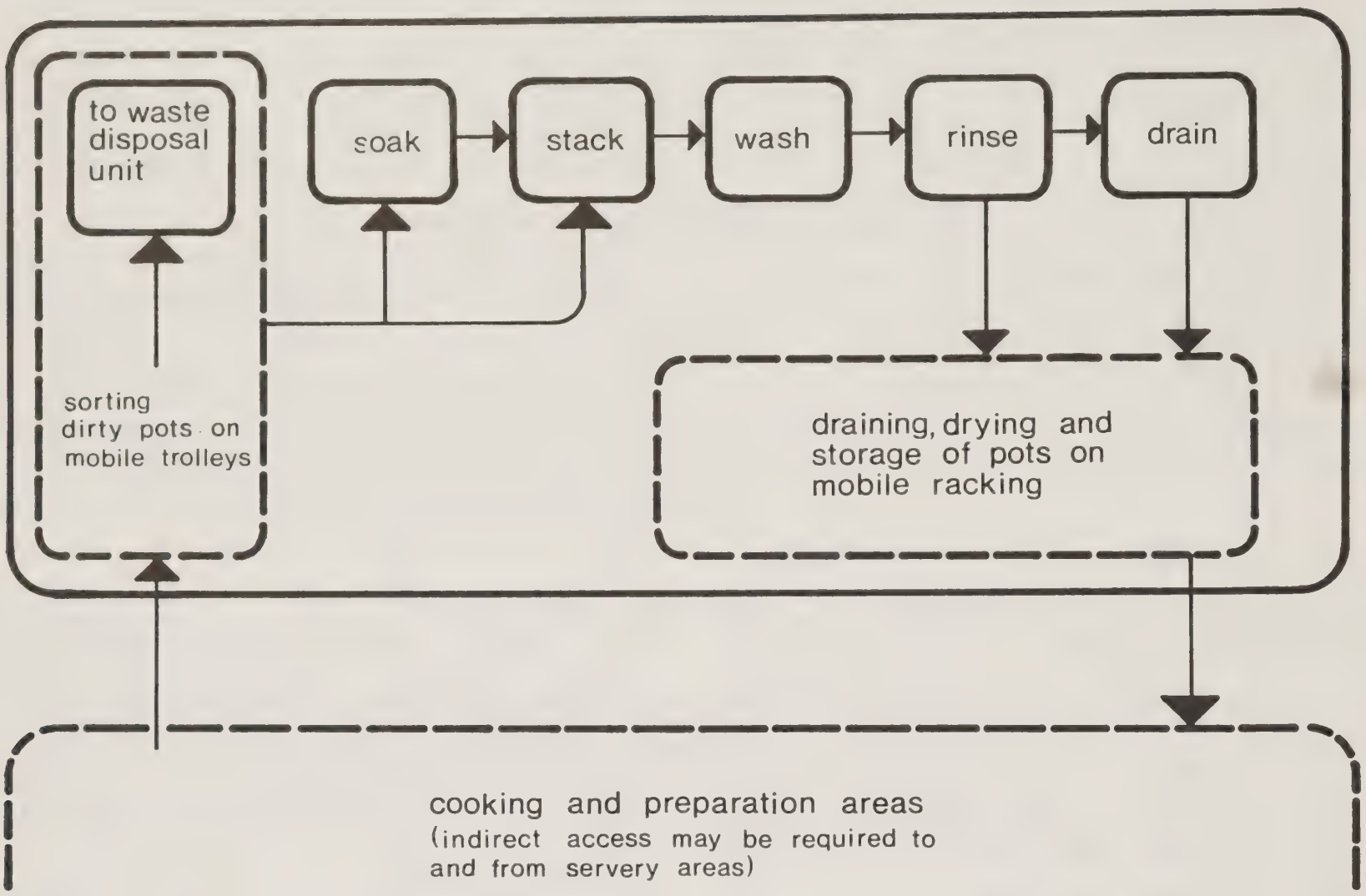
Kitchen superintendent's office

3.52 The kitchen superintendent should, whenever possible, have an office adjacent to the main cooking space with a view of the preparation spaces and staff entrances.

Patients' meals service

3.53 For the purposes of the Departmental Cost Allowance this note assumes the use of a central tray service for

Figure 24 Workflow: pan wash



patients together with provision for a limited bulk trolley service where required. Alternative types of service described are centrally plated and bulk trolley.

Central tray service

3.54 Patients choose dishes in advance for each meal on menu cards which are collected and checked in the ward for return to the catering department. Meals are plated to the patients' individual requirements in the central tray service space. Some modified diets are incorporated in the menu but those which cannot be included are prepared in the diet bay. The systems of tray service available are essentially similar, with variations, eg the method of keeping food hot. They generally provide main meals only and beverages are added to the tray at the ward.

Patients' tray service space

3.55 Meals are assembled using an electrically powered variable speed conveyor belt. Heated mobile food containers or bains marie are plugged in at intervals along each side of the belt. Serving staff stand in the spaces between equipment to serve food. There must be space for service trolleys to pass around the area. Space will also be needed for additional heated and unheated dispensers for plates, bases, lids and dishes. Individual trays with each patient's menu card move along the belt and, as they pass, the staff add appropriate items of food. Each plate is placed on a pre-heated base to keep it hot during delivery. On reaching the end of the belt the tray is checked, a cover placed on the plate and cutlery and condiments added. Each ward's set of trays is loaded into an unheated trolley and despatched immediately for service to patients. The heated bases will keep the food hot for a limited period of time, thus it is essential to minimise both delays in delivery and distribution at ward level. At the end of the meal, trays and contents are returned in trolleys to the central wash-up.

3.56 The length of the conveyor belt and number of bains marie required will vary according to the choice of meals offered and the number of trays to be assembled. It has been found in practice that a hospital of 600 beds with normal percentage occupancy levels and the possibility that at least one ward may use a bulk service, could be served using the one tray meal belt, as there is a certain amount of flexibility in the number of meals which can be provided with one belt. If the duration of the meal period becomes unacceptable using a speed of 7–8 trays per minute, a second belt may be required.

Patients' tray preparation bay

3.57 A patients' tray preparation bay is for the storage of accompaniments to the meal service and for the pre-wrapping of cutlery, filling of condiments sets etc. A refrigerator/deep freeze is required for dairy foods.

3.58 The recent development in tray services incorporates the use of micro-computers combined with a scanning device which reads each patient's card, notes the choice of dishes and totals the number of each dish required. It can also be programmed to reject cards where, for example, a diabetic has chosen the wrong dish. The kitchen is able to produce the correct number of portions required from the information supplied by this means. This system is already used in food factories for dispensing portions of food.

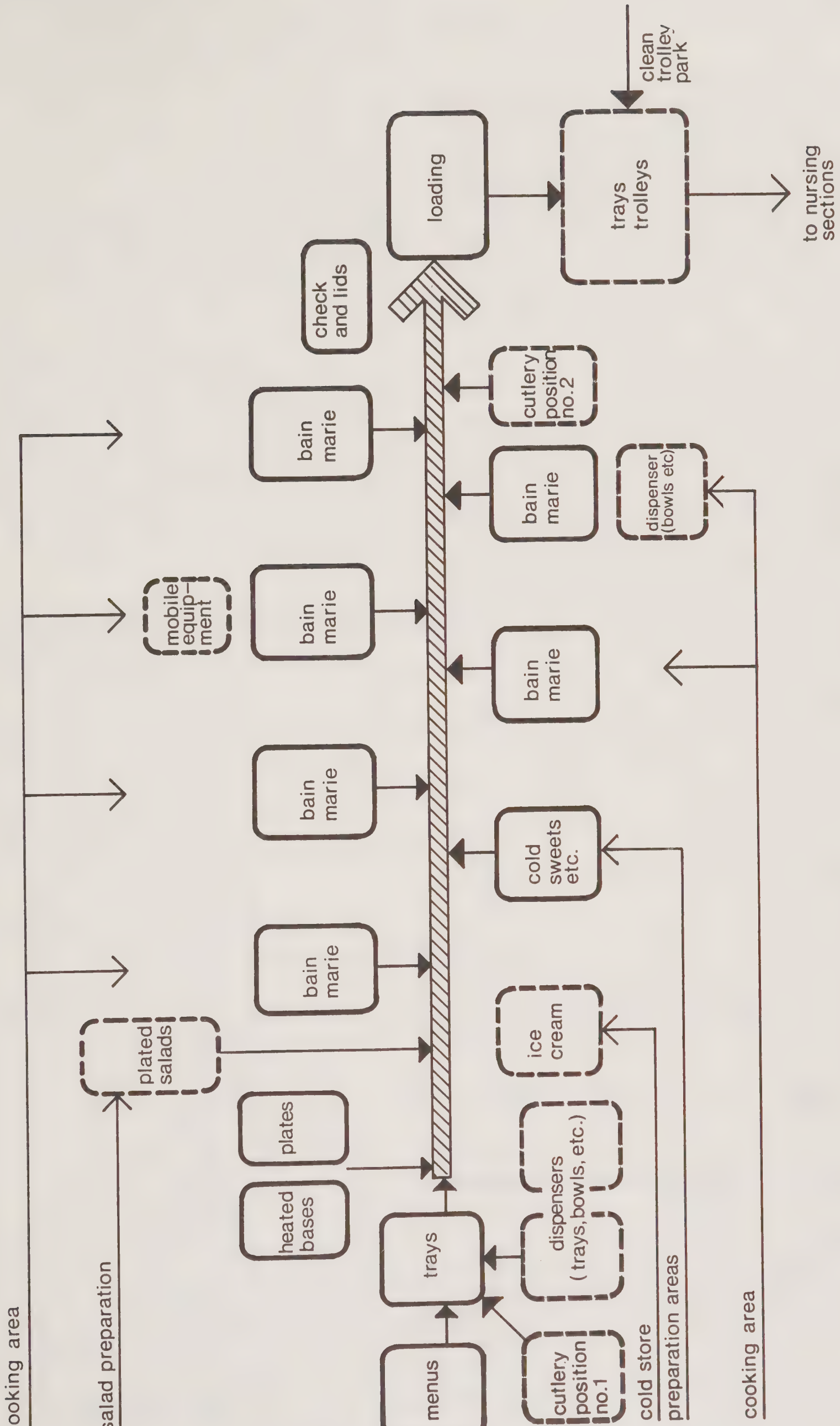


Figure 25 Workflow: patients tray service

Meals service supervisor's office

3.59 This should be adjacent to the central tray assembly area.

Centrally plated meals service

3.60 This service also provides patients with a choice of dishes and the meal is plated with or without the use of a conveyor belt. The plated meals are loaded into electrically preheated trolleys and transported to the wards. Patients' trays complete with cutlery and condiments are either delivered to the patient from the central kitchen or assembled in the ward using items held there. Dirty crockery would normally be returned to the central wash-up but in certain circumstances it may be washed in the ward pantry.

Bulk trolley service

3.61 This method has long been used in hospital catering and may still be appropriate in certain circumstances ie day hospitals/childrens' wards. Bulk quantities of food are taken in insulated trolleys to the ward where staff prepare trays, condiment sets and accompaniments to the meal. The trolley may be taken around the ward and meals plated to each patients' needs. The size of trolleys and numbers to be served restrict the choice of dishes available to patients. As fewer diets can be integrated in the menu, more may have to be prepared in the diet bay. The bulk trolley is either returned to the kitchen for emptying and cleaning or the food emptied and the containers washed in the ward pantry. If the dirty crockery and cutlery is not washed in the pantry but in the central wash-up, it is necessary to return those items on a separate trolley ready for the next meal. This service has a higher percentage of food wasted owing to the difficulties of estimating accurately the exact quantities of food required.

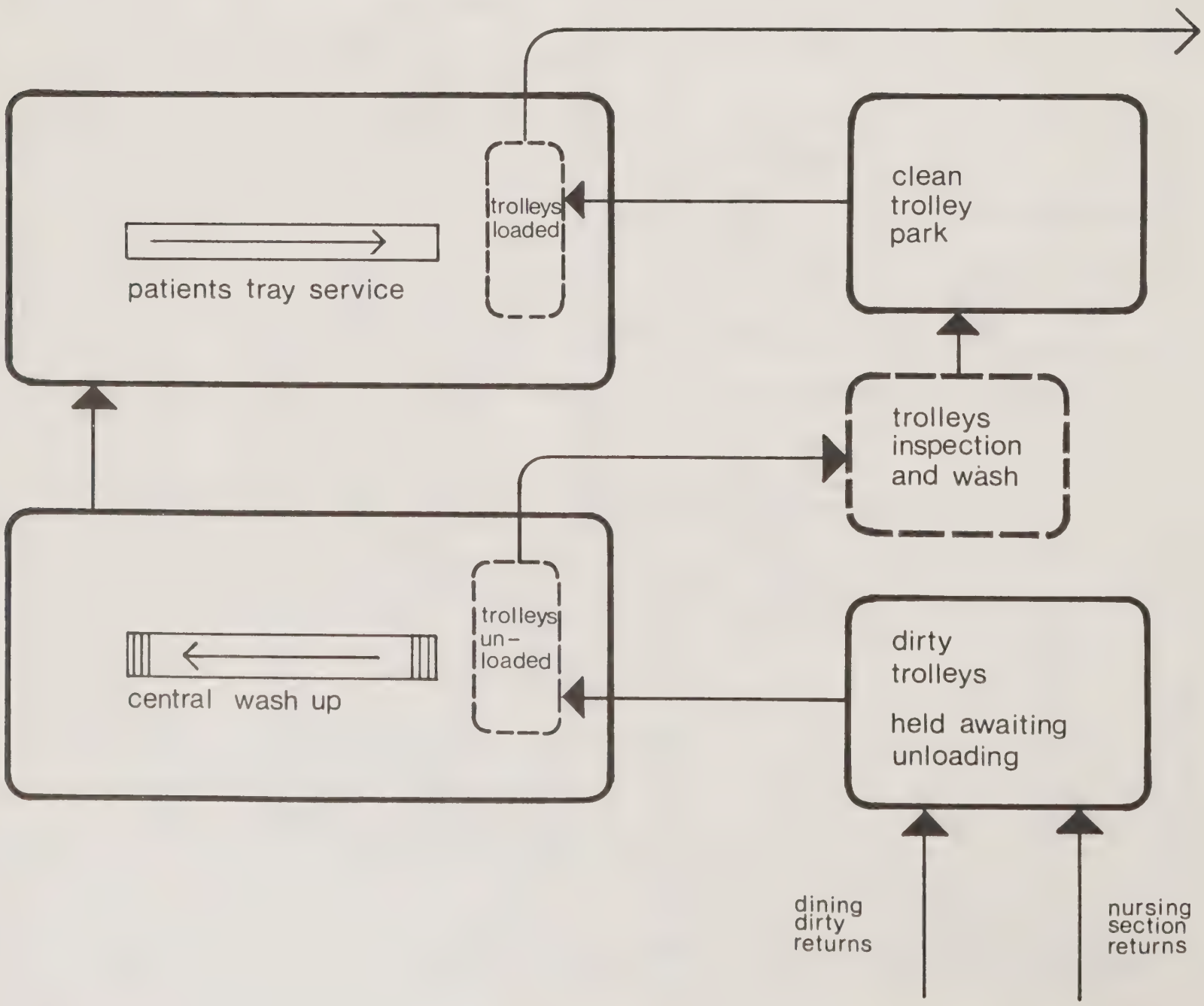
Trolley parking space

3.62 Depending on the type of meal service provided, space is required for the parking of trolleys adjacent to the tray service space. The tray trolleys may be parked close together, taken to the assembly area for loading and later returned to the bay after being unloaded and cleaned. If bulk service trolleys are used they will each require a socket outlet and be spaced apart so that staff may load them. This space may also be used for loading plated meal trolleys before despatch. Clean trolleys should always be routed separately from dirty trolleys. The walls of this space should be protected by a continuous buffer rail at the same height as the trolleys. The doors will also require extra protection, flexible transparent doors may be appropriate, all types will require vision panels to prevent collisons.

Queueing and stripping of dirty trolleys

3.63 Space is required in the central wash-up area for queueing and stripping of trolleys on their return. The use

Figure 26 Workflow : trolley parking and washing



of the tray service belt for stripping trays is not recommended as the assembly of meals is a 'clean function' and the possible soiling of the equipment (with risk of cross infection) must be avoided.

Trolley wash space

3.64 After stripping, the trolleys are taken to the trolley wash area. Space is needed for a trolley to be hosed inside and out from either side, with a curtain to prevent splashing. The floor of this area should be provided with a drain. The heated bulk food trolleys should not be hosed but hand-washed to prevent damage to the electrical equipment. After cleaning the trolleys are returned to the parking space.

Central wash-up

3.65 This space is for the washing and drying of crockery, cutlery, glassware and trays, used by patients, staff and visitors. It should have easy access to the central tray service, the staff restaurant and the main hospital corridor for the return of dirty trolleys. Natural light will help to provide a pleasant working environment for staff. Careful attention must be given to the ventilation system. To prevent a humid atmosphere and to minimise condensation the dishwasher should have its own extract system.

3.66 The dishwashing machine should be sited so that it is accessible on both sides for cleaning and maintenance. Space will be required alongside the dishwasher machine for the drums or containers of detergent in use. At one end will be stripping benches for the dirty crockery, and benches for clean crockery at the other end with plate dispensers ready for reloading. It is essential to keep these clean and dirty spaces separate and to plan the layout to avoid cross-flows of traffic and the risk of contamination. Clean crockery is not stored in this space but should be returned to the patient's tray service space or the staff serveries.

3.67 Other items needed in this area include fixed and mobile sinks, wall taps and a drain for filling and emptying the mobile sinks, and a food waste disposal unit. The subject of standby provision needs to be carefully examined to cover the eventuality of a breakdown of the dishwashing machine and consequence disruptions. A second machine will be required in larger departments as it would be impossible to cope with the washing-up manually.

Detergents' store

3.68 A dry, well-ventilated space is needed with racks and cupboard to hold the cleaning materials and detergents for use in the central wash-up and pan wash.

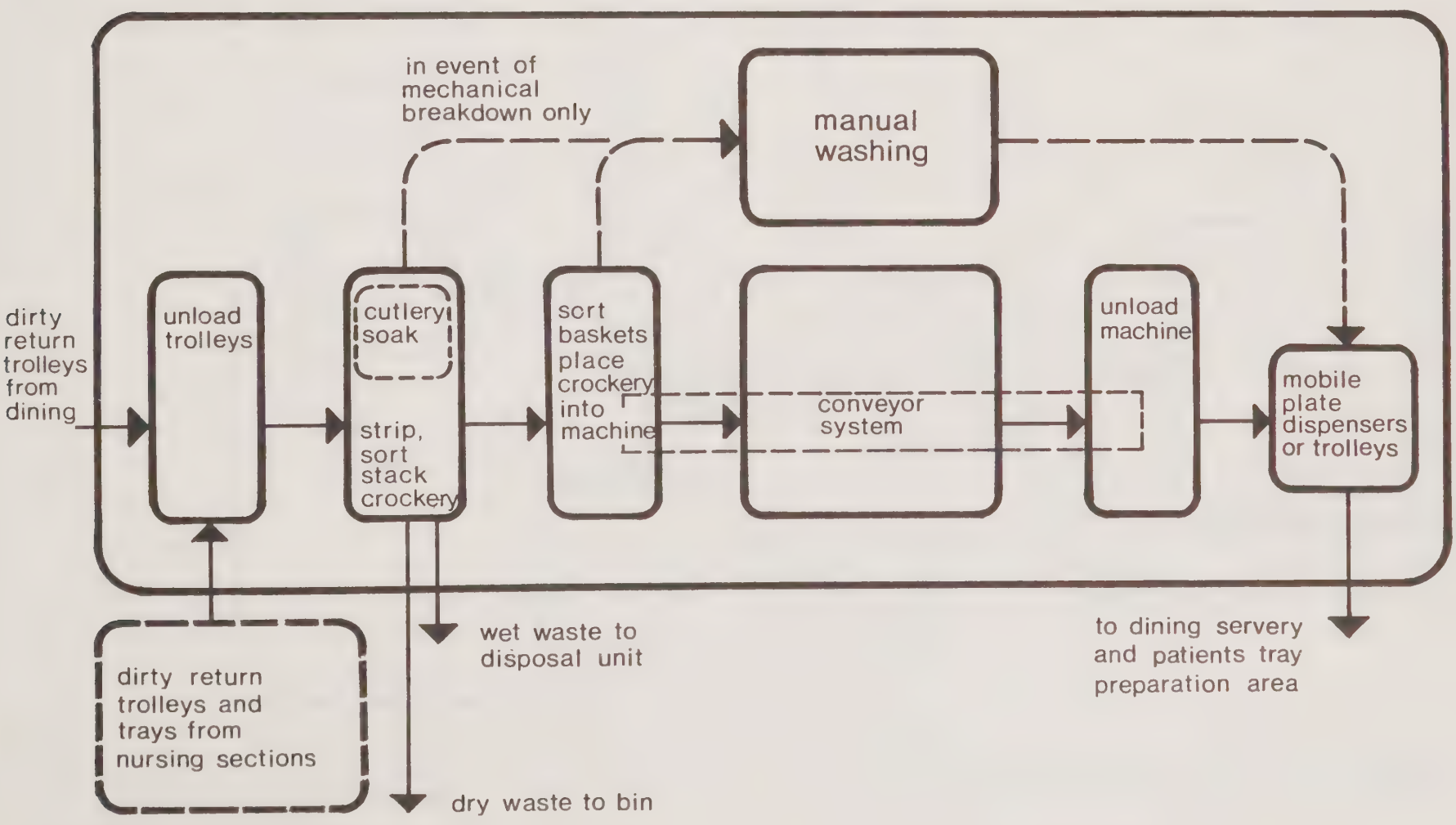
Cleaners' space (refer to Common Activity Spaces document)

3.69 This space will house the floor cleaning and drying machines and their ancillary equipment which is used throughout the kitchen space. It should be located within the kitchen and be well ventilated.

Lifts and hoists

3.70 Lifts and hoists, where provided, should not open directly into the kitchen or food preparation spaces but into a small lobby, with the floor level with the surrounding floor for ease of access for trolleys. They should be secure, rodent proof and have easy to clean linings. There should be an intercom between floors and the safe working load should be clearly marked and whether passengers are allowed, if so, how many. It is essential to ensure that both entrance doors and lifts are of sufficient size and capacity to facilitate the removal of trolleys and mobile equipment.

Figure 27 Workflow : central wash up


in event of mechanical breakdown only
manual washing
dirty return trolleys from dining
unload trolleys
cutlery soak
strip, sort stack crockery
sort baskets place crockery into machine
conveyor system
unload machine
mobile plate dispensers or trolleys
dirty return trolleys and trays from nursing sections
wet waste to disposal unit
dry waste to bin
to dining servery and patients tray preparation area

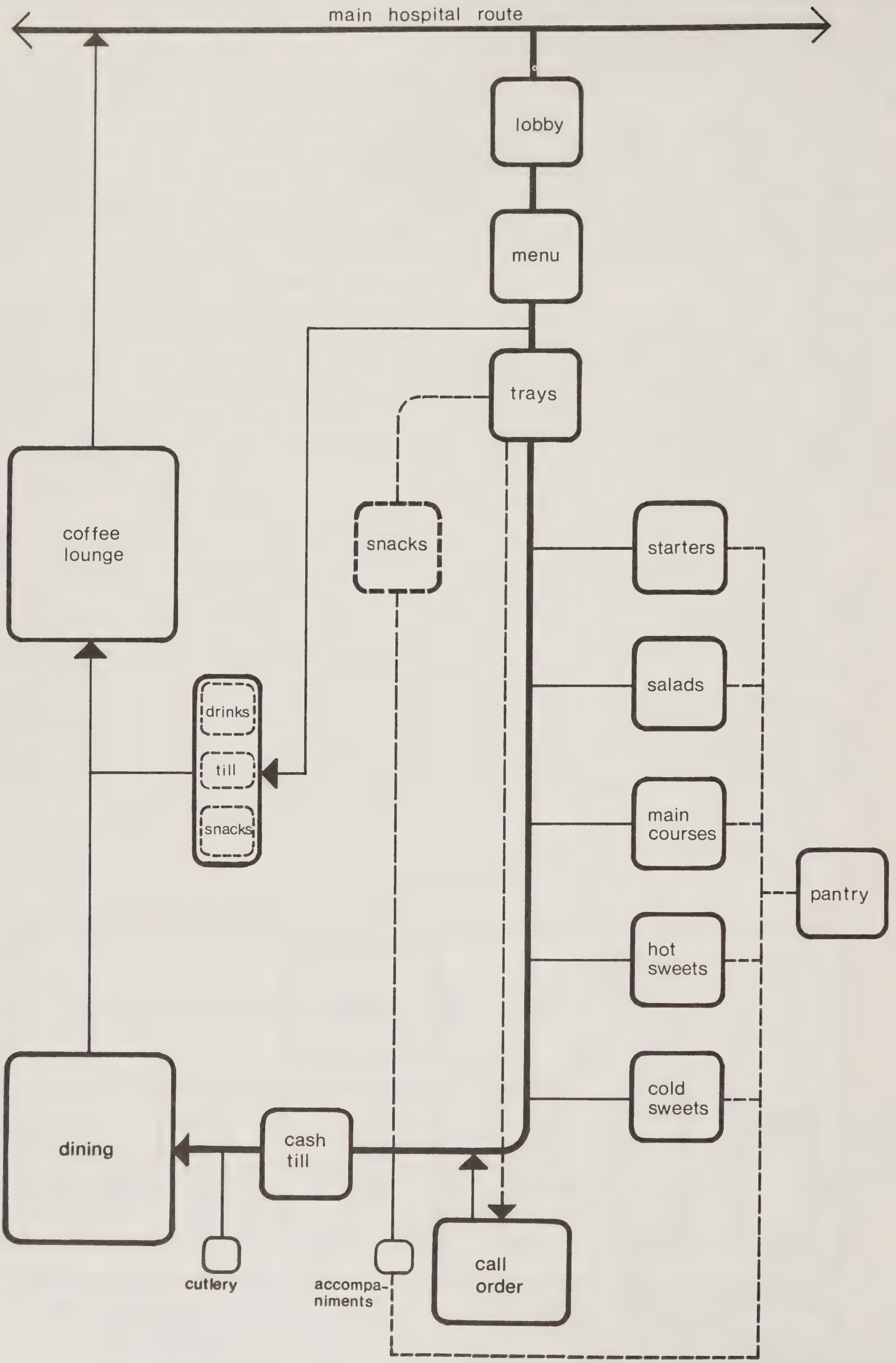
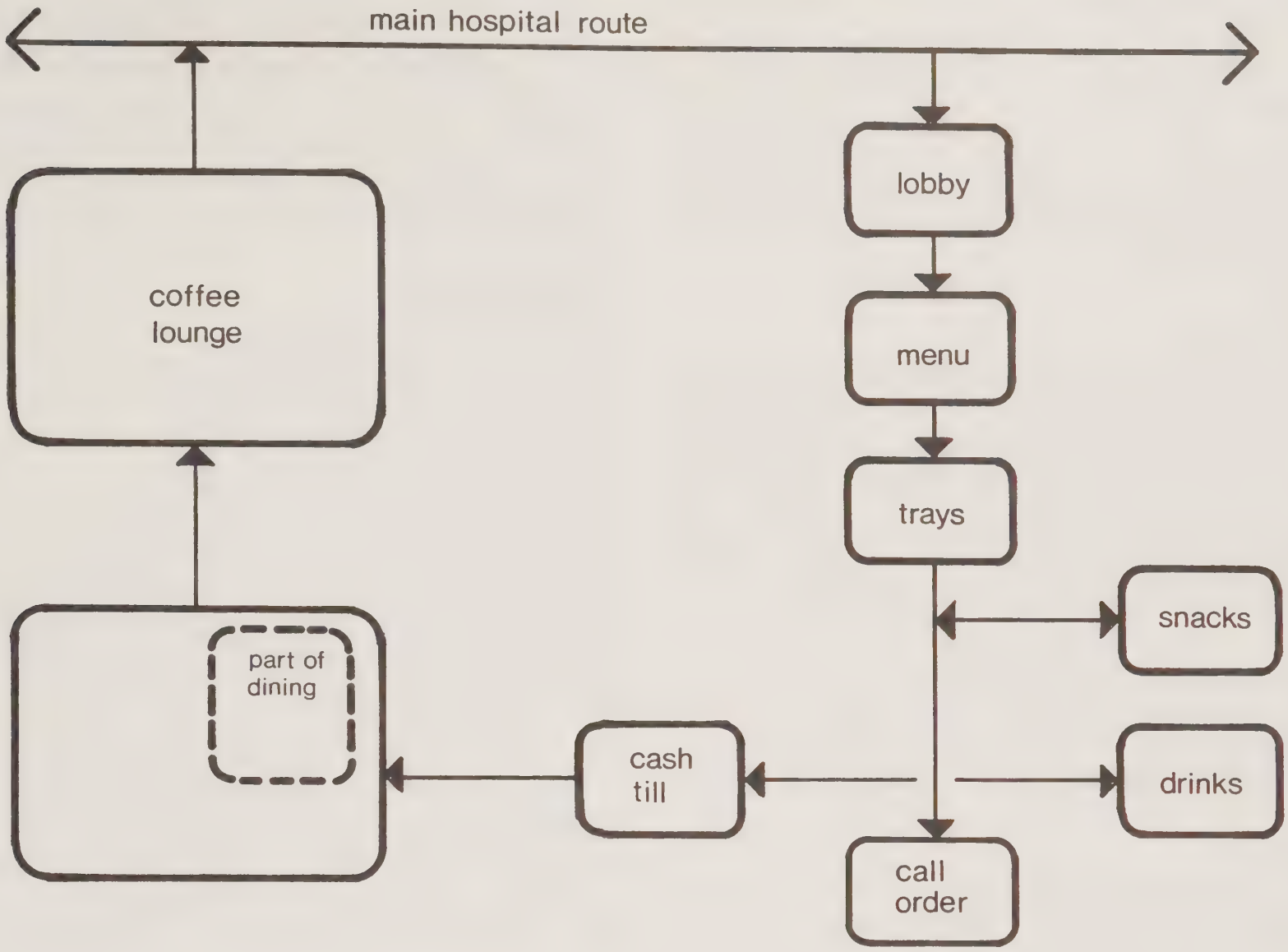


Figure 28 Workflow : restaurant servery

Figure 29 Workflow : Restaurant servery : breakfast and night service



RESTAURANT AND COFFEE LOUNGE

Entrance lobby

3.71 The lobby should open off the main hospital street with easy access to toilet facilities. In peak periods the lobby may become an overflow area for queueing. Minimum seating is required with space for coat hooks and umbrella stands. An internal telephone is essential and a coin-operated telephone is desirable. The day's menu should be in a prominent position. A pin-board for staff notices is also required.

Restaurant servery

3.72 For cafeteria service the total length and number of sections will depend on the peak number of diners to be served and the variety of dishes offered. The counter unit may incorporate lighting and display shelves which should be protected by a glass sneeze-plate. A tray slide is required. Mobile units should be arranged to facilitate the cleaning of the servery area. They may be arranged to suit local demand. (see paragraph 1.42 and Figure 3) A suggested sequence could be as follows:—

a. at the beginning of the servery there should be a large well-lit menu board giving details of dishes available and their prices

b. tray stands

c. cold counter—refrigerated with display case cover, used for salads, starters etc

d. cold counter—normal temperature for rolls, sandwiches etc

e. heated counter with infra-red heating lamps—for soups, main dishes and vegetables

f. plate dispenser—heated for main dishes

g. heated counter with infra-red lamp over—for puddings and sauces

h. cold counter—refrigerated for cold sweets, ice cream etc

i. plate dispenser for sweet dishes

j. beverage counter for hot and cold drinks

k. call-order unit with cooking equipment

l. salad bar—this may be sited separately in larger restaurants

m. cashiers' desks

n. cutlery, napkin and sauce dispensers

o. chilled water dispensers (may be sited in dining room)

p. many of the service units may be self-help models, where diners take a pre-portioned dish from the unit via a lifting cover. Similarly self-help beverage units may be used, these will reduce the number of serving staff required.

3.73 The call-order bar will be for grills and snacks and for breakfasts, and may also be used for night staff meals and beverages where the numbers requiring meals justifies staffing this unit. Alternatively a vending service may be used. The bench-mounted cooking units may comprise:

a. griddle

b. fryers

c. boiling rings

d. toasters

e. microwave ovens (3.49)

f. refrigerated unit

g. worktop with cupboard under

h. hand basin

i. beverage making unit

j. grill.

Cooking equipment may be sited at a right angle to the main counter so that cooks may work without turning their backs to the customer.

Pantry/food store

3.74 This store should be sited adjacent to the main servery and requires ventilation as bread, cereals and biscuits will be stored here. Storage units are also required for condiments, sauces, jams etc. The store should be lockable. The walls should be tiled and the worktop of stainless steel. Dairy items will be stored in a refrigerator which should be in the main servery and not within the pantry.

Dining room supervisor's office

3.75 An office sited to give visual control over the adjacent servery is required for the supervisor and for staff interviews. It may require a safe for cash received.

Restaurant

3.76 The need for an attractive environment has already been referred to. (1.30, 2.16) The furniture should be comfortable and arranged in varied groupings to provide an informal atmosphere. If waitress service is required this can be accommodated within the overall layout. A small sideboard or a dumb waiter will be required. If a table licence is obtained appropriate storage will be required for beer and wine.

Location

3.77 Wherever possible the dining space should be sited to give at least some east to south light, with an outdoor terrace or gardens, where coffee and snacks can be taken if desired, or the weather allows. This area could also be used for any future extension of the dining room or coffee lounge.

Tables

3.78 The size, shape and position of tables selected will affect the capacity or size of the dining space. Generally the types of tables used are as follows:

a. rectangular tables seating 4, 6 or 8

b. square tables seating 4

Although tables seating 6 or 8 take less space than those seating 4, it is preferable to use the smaller tables as these give pleasanter conditions, not so institutional, and provide more flexibility, allowing various arrangements. Square tables arranged in diagonal fashion are more economical of space than either rectangular or square tables placed at right angles to each other. Adequate gangways must be provided to allow easy access to and from tables.

Clearing options

3.79 There are several methods of clearing dining room tables. These are: –

a. clearing by staff using a trolley

b. self-clearing where the diners take their dishes from the service counter on a tray. At the end of the meal the diner places tray and dishes together on the racks provided for conveyance to the central wash-up

c. using a mechanical method where the diner places the tray in a moving conveyor belt or carousel which is linked to central wash-up. This method requires extra space and equipment but the extra cost of equipment may be partially offset by saving in staff costs.

Coffee lounge

3.80 The coffee lounge should be a pleasant area with comfortable seating arranged in groups around coffee tables. The apportionment of total area between the restaurant and the coffee lounge will depend on local policy and demand. Where the two spaces are contiguous they can be partitioned to permit adjustment from time to time. As the discouragement of smoking elsewhere may increase the amount of smoking done in the coffee lounge special consideration should be given to the ventilation of this area. (1.59) Trolleys used to clear away crockery etc will need suitable parking space.

3.81 This space can be sited to act as the entrance hall to the main dining room, provided that the circulation to the dining area is separate from the main seating space of the lounge. This space may be open all day to provide drinks and snack items to staff and official visitors or as long as the demand justifies the staffing cost.

Coffee lounge servery

3.82 This may be incorporated or separate from the restaurant servery so that independent opening hours are possible. A separate cash register is required and the counter should be shuttered when not in use. The servery will provide all kinds of beverages and cold snacks. Items like sandwiches etc may be supplied from the central kitchen. The servery should provide an attractive focal point and be well lit in contrast to the rest of the lounge. Normally all crockery will be returned to the central wash-up. Where the central wash-up is some distance away a separate dishwasher may be required.

Cleaners' room

3.83 A well ventilated room for the storage of cleaning equipment, used in the restaurant and coffee lounge is required.

Furniture store

3.84 For storing tables and chairs.

Linen room

3.85 For storing linen and all the disposable items eg serviettes used in the restaurant and coffee lounge.

VENDING MACHINES

3.86 Where vending machines are installed, the floor in front of the machine should be similar to that in the servery. (2.19) The equipment provided may include beverage, snack and chilled food vending machinery. In addition to these, a microwave oven may be required for heating chilled food. A change machine should also be

provided. The machines will require a power supply and also a water supply if beverages are to be dispensed. The area should be well lit.

OFFICES AND STAFF ACCOMMODATION

Catering manager, assistant and clerical staff (refer to Common Activity Spaces Building Note)

3.87 Offices required by the catering manager and the assistant catering manager should be close to the kitchen and the main hospital street. Clerical staff will require a general office adjacent to these offices with a small waiting space. These offices may be used by students from time to time. Space for computer facilities for summarising patients' needs and stock control may be required.

Staff changing rooms

3.88 To prevent any chance cross-contamination, it is strongly recommended that catering staff should have local washing and changing facilities, rather than use the central changing rooms. Separate changing rooms for male and female staff will be required with showers and toilets. Clean uniforms may be collected by the staff from a central point or delivered to the room in bulk from the laundry. Space may be needed for storing uniforms and chairs, and a large mobile bin for dirty uniforms. A locker for each member of staff should be provided. Work conditions and standards as laid down in the Offices, Shops and Railway Premises Act 1963 should be observed. Reference should also be made to Health Building Note No 41 'Accommodation for Staff Changing and Storage of Uniforms'.

Catering staff rest room

3.89 A separate room, with natural light and mechanical ventilation and with if possible, a pleasant outlook should be provided for catering staff use during rest periods.

Switchroom

3.90 A switchroom will be required for housing the main isolator and distribution switch/fuse-gear for the department. The room should be dry and well ventilated and the door should be lockable and open outwards. To minimise the radial length of circuit wiring the switchroom should whenever possible be located centrally within the department.

Gas meter room

3.91 The location must meet the requirements of Part III of the Gas Safety Regulations 1972 particularly Regulations 21 and 22 (Fire risk). It should be sited within the curtilage of the department and should be easily accessible for isolation of the gas supply and for meter reading.

4 Engineering

4.1 The engineering services for a catering department are complex and fundamental to the operation of the hospital and they will have an important influence on the planning process if successful integration is to be achieved. The location of the catering department and its operational policies will determine the options for the design of the associated engineering services. These options require analysis at the preliminary design stage and will include vertical and horizontal distribution zones, plantroom locations, ventilation intake and exhaust air locations. In addition, the performance limitations and operating costs of the engineering installations will influence the general layout and nature of the building envelope as well as the more detailed constructional elements of the fabric.

4.2 Some of the more important matters which should be examined at the early design stage are:

a. The possibility of the kitchen functional content increasing at some later date, thereby influencing the initial size of distribution and plant zones. An element of adaptability should be available within any design, particularly in equipment zones, where improved models are continuously being developed. Such adaptability is particularly necessary in hospitals which are subject to extensive planning stages.

b. The catering operation requires conditions of cleanliness and safety with means of access for maintenance and routine inspection that minimise disruption and risk of contamination. Engineering services and catering equipment will normally have a much shorter life than the building fabric and access for plant removal and replacement should, therefore, form part of the design concept. Catering departments are very prone to infestation and service ducts, trunking, channels, casings, pipework and insulation should be designed and installed to prevent the ingress of rodents and insects. All thermal insulation should incorporate an impermeable washable finish.

c. High levels of radiant heat emission together with high humidity are common in most kitchens and create uncongenial working conditions. Project engineers should recognise the increasing influence of health and welfare requirements on design standards. Whilst improved equipment design may reduce space heat gains nevertheless the need for mechanical ventilation will remain.

d. The provision of supply air both direct and induced needs careful consideration in interdepartmental planning. Supply air intakes and extracts should be carefully located to attenuate unwanted noise and nuisance and both ventilation and drainage services can create significant demands on space and access needs when passing through adjacent departments.

e. Particular attention should be paid to fire risks arising from frying ranges and similar equipment where grease deposits in duct-work and on filters may create a hazardous condition. Detailed recommendations for the fire protection of health buildings are given in HTM 81[1]* and the design of the engineering services should accord with these recommendations. Advice concerning fire detection and alarm systems is given in HTM 82[2] and BS 5839 Pt 1,[3] while HTM 83[4] provides general and specific guidance concerning fire precautions in catering departments. The engineer should verify his proposals in accordance with the procedure described in paragraph 1.56.

f. Catering departments are major consumers of process heat and Engineering Data Sheet EC3[5] identifies measures that can be implemented to improve energy conservation. Whilst the primary aim is to minimise energy usage by energy-conscious operational policies and by design eg improved insulation and controls to reduce excess heat emission from equipment, a secondary aim should be to achieve heat recovery where viable. The obvious sources of recovery are heat from extract air, and condenser heat from refrigerated rooms. Less obvious but worth considering, is the potential for reclamation from drainage wastes by the use of heat pumps. Each aspect of energy recovery should be evaluated and implemented where economically viable. In many cases sufficient adaptability can be built into system design and plantroom accommodation to allow phased implementation at a later date. Engineering services should however be designed to obtain the optimum benefits from the capital invested. Where alternative design solutions are available their consequential capital and running costs should be compared using Present Worth[6] techniques.

g. The facilities required for commissioning purposes should be incorporated in the detailed design of engineering services and HTM 17[7] describes the requirements.

Distribution zones

4.3 The nature of kitchen planning will usually dictate that primary services are mainly located in horizontal zones above and below the user areas. Considerable space is required (particularly the depth of zones) to accommodate ventilation ducts and drainage gradients. An early assess-

*In preparation

ment of primary zones is necessary to allow the structural design to incorporate clear through-ways where required. Secondary zones will also be required for water, gas, steam, condense and electrical services together with heating installation pipework for the dining room and amenity areas. These services may be located over the kitchen area within the ceiling void or below the floor slab as appropriate. Where low height walls are provided to segregate food preparation areas from island equipment, it will generally be preferable to distribute services to equipment from below. To minimise perforation of the floor slab, services to a group of equipment should be via above-floor bus-mains enclosed within a services spine designed to allow segregation of services but with easy access and adequate ventilation. For ground floor situations where it is necessary to distribute primary services at low level, consideration should be given to providing a man-access undercroft rather than several small ducts with removable access covers; access ducts in the kitchen are prone to water penetration, infestation and a consequential reduction of general hygiene standards. It is essential that services are effectively coordinated with the structure and fabric to achieve the high standard of finishes needed. Holes into or through the fabric should be effectively sealed using a sealant which can accommodate some thermal movement without cracking.

Plantrooms

4.4 A major factor affecting engineering services design is plantroom and switchroom locations. Adequate space is required to accommodate air handling plant, particularly where heat recovery equipment is installed. Whilst decentralised plant such as individual roof-mounted supply and extract fans may be suitable in some designs, economic heat recovery using this method is not easily achieved. Plantroom locations should allow easy access for maintenance staff and plant replacement. Adequate lighting and power supplies for hand tools should be installed. Recommended spatial requirements for mechanical, electrical and public health engineering services in health buildings are given in HTM 23[8]. This information is specifically intended for use during the initial planning stages when precise dimensional details of plant is not available. Switchroom should be in accordance with HTM 7[9].

Noise control

4.5 Whilst an above average ambient noise level is normally acceptable in kitchens, an analysis of all significant noise producing sources should be carried out. Where necessary, noise distribution should be reduced by acoustic treatment at the source using constructional or acoustic enclosures and attenuators. Guidance on noise control is given in Hospital Design Note 4[10] including its revisions[11] and Engineering Data Sheet DH 1[12].

Meters

4.6 Meters for gas, steam, water and electricity are necessary for monitoring energy costs and can help to identify excessive consumption due to malfunction of equipment or controls. Unless fuel consumption in the catering department is known, an energy-conscious management approach will be difficult to apply. Engineering Data Sheet DR 6[13] describes recent developments in metering techniques.

Model specification

4.7 The library of standard specifications issued in the CS series[14] of engineering data sheets is currently being updated and will be re-issued as a model specification for engineering services in health care buildings. The cost allowance for the engineering services in each functional unit of this department is based on qualities of material and workmanship described in the model specification.

Safety

4.8 Section 6 of the Health and Safety at Work etc Act 1974[15] imposes statutory duties on all persons who design, manufacture, supply, install or erect 'articles' for use at work, to ensure as far as is reasonably practicable that such articles are safe and without risk to health when properly used. Engineering systems eg pipework, terminals etc are covered by the term 'articles' and thus these duties apply to the designers of engineering services for non-domestic buildings.

Activity data

4.9 User requirements, environmental conditions and equipment arrangements, as exemplified in the Activity Data Sheets (Chapter 5) should be referred to when detailing service components and outlets.

Fuel selection

4.10 The choice of fuel for food processing should be based on the following considerations:

a. the type of heat required for a particular process

b. the most economical fuel

c. security of supply and the need to avoid excessive dependence on any one fuel

d. the availability of supply.

The choice of equipment should provide for some flexibility between the available fuels to allow an emergency catering service to be maintained if any one fuel supply fails. The major part of the equipment will normally be heated by gas which is flexible in use. Historically, gas has a good record for security of supply but total freedom from interruption cannot be assured; in some circumstances it could be very much more difficult and take far longer to restore gas supplies following disruption than is the case with electricity. Some gas equipment requires an electrical supply for operation of controls and this should be provided from the essential supply. Electricity is required for much of the preparation equipment and is useful for certain heating processes. The electrical cooking load should not however be allowed to impose an excessive burden on the hospital 'maximum demand' and this aspect needs consideration when selecting electrically heated equipment. Food refrigeration plant and emergency lighting should be supplied from essential circuits but electrical cooking loads should not normally be connected to standby emergency supplies. It would however be prudent to provide some manual switching facilities so that, subject to the prevailing load on the generator and possible switching of other loads, cooking equipment could be connected to it in an emergency but additional

generator capacity should not be installed solely for that purpose. The use of steam as a heat source for catering has only a limited application but does offer advantages as an alternative source of energy if gas or electricity supplies are disrupted. Where a steam supply is available, it should be used for 'wet' cooking processes but the use of steam in the kitchen should not dictate its choice as a primary heating medium for the whole hospital. Where medium pressure hot water is used for primary heating it may be possible depending on temperature and pressure to generate steam local to the kitchen.

Maximum demand

4.11 User demand on engineering services is often difficult to predict but experience indicates that services designed for simultaneous peak load conditions are seldom fully utilised in practice. The estimated maximum demand and storage requirement (where appropriate) for each engineering service in this department will need to be assessed individually to take account of building shape, geographical location, operational policies, equipment selection and intensity of use. As a guide and for preliminary planning purposes only, the following are the estimated maximum demands for a 1200 meal kitchen and a 600 meal dining room.

1200 Meals	Maximum demand
Heating, including Supply Air	Variable
Domestic Hot Water Supply	90 KW (2 hours)
Ventilation	49 m^3/sec
Lighting and Power*	179 KW
Catering Equipment	
Gas	460 KW
Electricity	117 KW
Steam	350 KW
Water	Litres/sec
Domestic Hot Water Supply	2.1
Cold Water Supply	3
Storage	See Para 4.34

*Includes food preparation equipment and cold rooms.

MECHANICAL SERVICES

4.12 The heating and ventilation services for Catering Departments should generally be self-contained with only the primary heating source taken from the central services.

Heating

4.13 Space heating requirements should be calculated using the design conditions shown in the Activity Data Sheets based on an outside air temperature range related to locality. Cooking and servery areas will require little or no space heating during peak working hours. Provision should however be made to prevent overnight freezing or condensation and for adequate preheating prior to occupational periods. Ancillary rooms, ie office, staff rooms and cloakrooms will require heating and store rooms should be heated to the minimum level required to prevent condensation. The space heating system should be divided where practicable into separately controlled zones related to each major facade and core area of the department. Where over-heating in perimeter rooms is likely to occur thermostatic radiator valves should be installed. These valves should be of robust construction incorporating a tamper-proof facility for pre-setting maximum and minimum room temperature.

4.14 Space heating requirements in kitchen ancillary rooms, dining areas and coffee lounge can be satisfied by low temperature hot water radiators and convectors operating as a sub-system from the primary heating system and controlled via an external compensator. The dining area should be provided with a heating system compatible with the remainder of the hospital development. This may take the form of continuous natural convector heating or radiators around the perimeter of the dining area. Information regarding the selection of heat emitters including their mechanical and thermal characteristics, methods of mounting and fixing are giving in Engineering Data Sheet DN 4[16].

Ventilation

4.15 The major requirements which influence the need for ventilation within a catering department are:

a. removal of steam, food vapours and exhaust gases

b. tempered fresh air requirements for occupants

c. air movement for staff working adjacent to heat producing equipment

d. prevention of kitchen odours permeating other parts of the hospital

e. prevention of condensation

f. heat transfer requirements to limit temperature rise resulting from solar, occupancy, lighting and principally, equipment heat gains.

4.16 These objectives can only usually be achieved in the cooking, wash-up and servery areas by the provision of mechanical ventilation comprising supply and extract systems with interlocking controls. Extract air volumes should be based on the type, size and location of catering equipment used and should take into consideration thermal efficiency of equipment, normal operating loads and pattern of usage, all of which influence the amount of heat and vapour emission. Estimating the ventilation requirements by considering only the kitchen volume and area or by specifying an empirical figure for the hourly air-change rate is not acceptable.

4.17 The heat load may be estimated from published tables [17, 18] of potential heat gains for typical types and sizes of equipment operating under normal conditions but a more accurate calculation of appliance heat load can be made if the instantaneous rate of energy input required to maintain the appliance temperatures necessary for typical cooking tasks is known. The manufacturer's input rating includes provision for fast warm-up times and maximum temperature settings and is therefore greater than the normal instantaneous rate of energy input. For an appliance without a separate exhaust flue to atmosphere all the energy supplied appears as heat gain to the kitchen. With an effective exhaust canopy however only the radiative heat loss from the hot surfaces contributes to the room heat gain, and this will vary between 10%–30% of the energy input, the lower figure being applicable to appliances encased with highly efficient thermal insulating jackets.

4.18 The full calculation of kitchen heat load requires estimate of the miscellaneous heat gains eg conveyor belt motors, occupants etc and the latent heat load from uncovered boiling pans, but these contributions are likely to be negligible in comparison with the radiant heat load from the cooking appliances. The heat loss through the fabric of the building in winter and through infiltration of air through doors and windows should be calculated, and the solar gain may be significant in summer. The calculated kitchen heat gain, which will vary for summer and winter conditions and for periods of peak and night time use, is the basis for estimating the extract airflow rate required for the kitchen. With air entering the canopy exhaust limited to a temperature not exceeding 60°C and with a recommended maximum temperature rise within the equipment zone of 7°C the required mass flow rate can be calculated.

4.19 The airflow rate obtained by the above procedure must be sufficient to ensure adequate capture velocity in the vicinity of the exhaust canopy. The face or entrance velocity should be at least 0.2 m/s for a wall-canopy, corresponding to a capture velocity at the front of the cooking appliances of 0.15 m/s. The minimum face velocity should be increased to 0.25 m/s for island canopies and for hoods serving appliances such as deep-fat fryers which in addition to heat also generate smoke and grease laden vapour. Also to ensure the satisfactory operation of grease filters and to minimise the precipitation of moisture and grease within extract ductwork a minimum air velocity of 8 m/s is required. The face velocity should be multiplied by face area to determine the necessary airflow rate through the canopy and if the aggregated flow-rate for all canopies is greater than that calculated to remove the heat gain from the kitchen then the higher flow-rate should be selected as the design figure.

4.20 It is not practicable to rely on natural ventilation to provide the quantity and quality of make-up air required for large kitchens and a mechanical supply air system should be installed. It should provide between 80 and 90 per cent of the extract volume to ensure that air movement is towards the cooking area. Careful consideration should be given to make-up air paths to avoid user discomfort or, in the case of the servery areas, the cooling effect on the food. The supply air system temperature should be scheduled either by a space-mounted detector or by remote set-point adjustment located in a suitable position within the department. Override control should be included to ensure a minimum supply air temperature of 16°C at any time. Mechanical cooling is not normally provided.

4.21 Ventilation supply plant should incorporate air filters of 95% efficiency against BS 2831[19] Test Dust No. 2. Filters must be readily accessible for replacement and provided with a pressure differential manometer; coarse pre-filters may be justified where the intake air is exceptionally polluted. All filters should be provided with local and remote 'change filter' indication and should be protected from frost. There are no special requirements relating to the design of filter or type of filtering medium except that glassfibre filters are not acceptable.

4.22 To encourage energy conservation ventilation systems should be programmed to suit the functional requirements and time-switch controlled. Provision should also be made for varying the volume of the main supply and extract system in accordance with the number and types of cooking and other ancillary equipment in simultaneous use. This may be achieved by zoning the kitchen ventilation system and incorporating variable volume control in the branch ductwork for each zone operating in conjunction with one of the systems for varying the fan volume described in para 4.25. The extract volume from each zone, frying equipment (4.24) and dishwashers (4.26c) excepted, may be controlled by a two stage thermostat (or humidistat for 'wet' processes) scheduled to provide a maximum and pre-determined minimum volume but with a manual time-limited override 'start' switch for local zone use. The selection of variable volume control dampers should not necessitate installation of attenuators and for ease of cleaning and maintenance they should be located in plant-rooms or ceiling voids over stores and circulation areas rather than above catering equipment.

4.23 With the extract variable volume dampers operating automatically under the dictate of local zone controls the central variable volume extract plant should be capable of maintaining a constant static pressure to ensure optimum capture velocity at exhaust hoods. The central supply air plant should modulate in tandem with the combined demand of the central variable volume and independent constant volume extract systems and should also incorporate a static pressure regulator to ensure optimum performance of air diffusers. Controls may be electrically or pneumatically operated.

4.24 Due to the fire risk arising from the high level of contamination likely to be encountered in the air extracted from the frying battery, this should be ducted to atmosphere independently of any other extract system with the fan motor controlled by a local emergency isolator. Even with grease interceptors the level of contamination would normally preclude the use of variable volume devices in the extract ductwork.

4.25 Variable volume operation of fan systems may be achieved by using inlet guide vanes, variable pitch impeller or variable speed. The selection should be based on turndown requirements, efficiency and the need to restrict the levels of electrical interference ie controls for any variable speed drives should comply with BS 800[20]. Fans should be selected for peak efficiency at the point of normal, not peak operation and should be related to the fan speed. For further information see Engineering Data Sheet DV 1.17[21].

4.26 Ventilation should be provided to ancillary spaces as follows:

a. Staff rest room, changing rooms, cleaners room etc should be ventilated in accordance with the requirements indicated on Activity Data Sheets.

b. A separate extract system will be required for toilet areas and a dual motor/fan unit should be provided to ensure that these areas are maintained at a negative pressure relative to the kitchen and dining room.

c. The central wash-up and meal tray service areas should be mechanically ventilated with the extract rate based on the sensible and latent heat emission from

equipment. The normally high rate of make-up air should be introduced into these areas with due consideration for the equipment operators. For dishwashing machines without integral exhaust hoods a canopy should be provided at both the entry and ejection end of the conveyor. To facilitate energy recovery from exhaust vapour the dishwasher should have an independent locally controlled constant volume extract system using a two speed fan motor and sequential dampers when two machines are installed.

d. The coffee lounge and associated servery and the call-order bar servery should be provided with separate constant volume ventilation systems to take into account the differing types of occupancy eg smoking and non-smoking areas in the coffee lounge and the need for the call-order facility to be available for night staff use.

e. With the exception of the servery the main dining area should be naturally ventilated.

4.27 Ductwork should be fabricated from galvanised sheet steel of sufficient gauge to allow for constant cleaning and scraping. For short runs in wet extracts (eg dish washer) PVC, anodised aluminium or stainless steel ductwork should be used. Extract ductwork should be graded back to the hood or appliance served and cleaning access points should be provided at all changes of direction and at 2.5 m centres in straight runs with entries suitably sized to enable all internal ductwork surfaces to be reached. Where walk-in access doors are provided a fan starter lock-out should be provided adjacent to the access door.

4.28 Ductwork should be insulated to minimise condensation of grease vapour within ductwork and to reduce heat loss where thermal reclamation systems are employed. External insulation should be adequately protected against inclement weather.

4.29 Grills and diffusers may be used in areas with low air-change rates and terminal velocities should be selected to minimise noise and discomfort from draughts. Grilles and diffusers should incorporate key-operated deflectors for directional control. Where terminal volume control dampers are unavoidable they should be adjustable from the face of the unit without removal and be tamperproof. Where grilles and diffusers are employed in variable air volume systems it is necessary to ensure uniform air distribution over the full range of air volumes. For this reason perforated diffuser panels are to be preferred in cooking, tray service and wash-up areas, where large air volumes are required. All air distribution equipment should have a smooth easy-clean finish with volume controls designed to resist movement during normal cleaning operations.

4.30 Air intakes and exhausts should be weatherproof and fitted with an insect screen. They should also be adequately sized to reduce noise generation and located at high level to minimise contamination and vandalism but protected against wind effect. Where there are noise sensitive areas near the catering department special care should be taken in siting plant and air intake and exhaust terminals to minimise potential noise nuisance. Particular attention should be paid to the locational relationship between terminals serving this and adjacent departments and also openable windows to avoid reintroduction of contaminated air.

Canopies

4.31 Extract canopies with their lowest edge 2 m above finished floor level should be provided over all major cooking and servery equipment. They may be fabricated from sheet metal, Georgian wired glass or similar non-combustable materials except that aluminium should not be used above frying equipment. A drain channel along the lower edge with a flush drainage/cleaning eye should be provided. Grease filters may be of the washable or disposal type and adequate provision should be made for removal and/or cleaning. Grease filtering or elimination equipment should incorporate a drain drip channel. Equipment arrangements that provide excessive back-to-back or back-to-wall clearances results in an overlarge canopy and a corresponding increase in the airflow to achieve the appropriate capture velocity. Canopy designs allowing a minimum overhang of 300 mm beyond the front of equipment should not be finalised until an economical layout of the equipment and its associated services with access for maintenance has been agreed. Provision should be made for suitable lighting under large canopies and luminaires built into the canopy perimeter often provide an adequate solution. (4.70) High velocity air curtains at the perimeter of canopies interfere with the capture velocity and are not recommended. Internal divider plates may be used to improve the capture velocity performance in large canopies, where variable volume ventilation is used. Where island canopies serve only one row of appliances a back plate is recommended. Shelving systems within the boundary of canopies are not recommended as they decrease the efficiency of the system by interfering with airflow, and constitute a maintenance problem.

Heat reclamation

4.32 Kitchen ventilation is not normally recirculatory and therefore a significant quantity of heat is exhausted to atmosphere. Where a local comparable heat demand can be supplied economically by thermal reclamation, heat recovery equipment should be installed. The cooling effect on the extract air will require drains for condensate and access for cleaning heat exchangers. Selection should be based on efficiency, maintenance requirements and the practical reliability of the preferred system. Run-around-coils offer ease of installation in either new or existing plantrooms and, like plate heat exchangers, require little maintenance. Consideration should also be given to optional heat recovery equipment offered by equipment manufacturers, eg air-to-water heat reclaim devices fitted to large dish-washers which are capable of preheating domestic hot water.

WATER SERVICES

4.33 Adequate provision of hot and cold water is required and this will generally be provided from the main hospital installation or from local mains, storage tanks and calorifiers. Potable cold water is required in all food and beverage preparation areas and for direct connections to boiling pans, steamers, servery outlets, and drinking water dispensers. The provision of hot water at about 60°C is

required throughout the department, with a major requirement for dish and pan-washing the latter requiring locally boosted temperatures for sanitising purposes. Amenity areas also require hot and cold water for sanitary facilities and sinks. Design and commissioning of the water services should comply with the local water regulations, and HTM 27[22].

4.34 Where local storage is to be provided, a volume sufficient for 24 hours supply is advisable with a minimum of 12 hours supply. The total quantity of water used per main meal varies but a daily storage of about 16 litres per main meal will generally be adequate. Of this amount about 8 litres will be used as hot water. Potable cold water should be stored in protected tanks with screened overflows and vents and the temperature should not exceed 20°C. Supply and draw-off connections on tanks should be arranged to achieve cross-flow through the tank by water circulation. Where duplicate tanks are connected in parallel, the hydraulic design should ensure that draw-off takes place from both tanks. Insulation, incorporating a vapour seal on cold water services, should be applied to hot and cold water installations where appropriate.

4.35 Water supplies to appliances should be compatible with the pressure/volume requirements specified by the manufacturer and dish-washers may require an integral booster pump and treated water to ensure satisfactory operation. All equipment should have adequate isolation valves and where these are located in kitchen areas should be fitted with an easily cleaned cover. Where a hose fitting may be connected to an outlet or wherever back syphonage may occur, anti-syphonage devices of an approved type should be incorporated.

Fire-fighting equipment

4.36 Fire-fighting equipment should consist of hydraulic hose-reels, portable fire extinguishers and fire blankets which should be positioned so that adequate cover is given to the whole interior of the department. Carbon-dioxide extinguishers should be provided to cover electrical risks but for other risks, eg ignited liquid or gas, either carbon-dioxide or dry powder extinguishers are appropriate. Extinguishers should comply with BS 5423[23] and further guidance concerning their selection and use is given in HTM 83[4].

DRAINAGE

4.37 An efficient and trouble-free drainage installation is particularly essential for the catering department and since food preparation areas in the kitchens are ultimately linked to a common drainage system serving the entire hospital the only preventative measures to avoid cross-contamination are those based on good design. The drainage from equipment and appliances should be self-cleansing, quiet in operation and should not allow air from the installation to enter the premises. To avoid the risk of cross-contamination arising from the backing-up of discharges caused by blockages in other departments the kitchen drainage should normally operate as a discrete installation within the building. Junctions with the main drainage should be made well clear of the building precincts.

4.38 The drainage installation should be direct and simple with the minimum changes of direction and avoiding sharp bends in either the horizontal or vertical planes. Gradients on horizontal branches below floor level should not be less than 1:50 and all waste branches should drop vertically through the floor. Where substantial quantities of kitchen effluent are to be discharged, early discussions should be held with the local authority who should be informed of the peak and average discharge volumes. The design should meet local authority regulations and the provisions of BS 5572[24] and Engineering Data Sheet EA 5.1[25].

4.39 The layout of kitchens usually precludes the close grouping of drainage inlets. The retention of water seals in traps is however essential and can be achieved by providing an adequate drain ventilation system which by allowing air movement maintains pressure fluctuations within an acceptable range. Such provision needs careful detailing, particularly where dwarf walls makes routing of drain vents difficult to accommodate. Self-cleansing tubular traps of uniform bore, having a 75 mm water seal should be used, and these should incorporate a readily accessible means of disconnection and inspection.

4.40 In kitchens the risk of blockages is increased by the high proportion of grease and suspended solids in the effluent. All parts of the installation should be accessible for commissioning and periodic inspection, and to clear a blockage in an emergency. For the latter it is preferable to locate maintenance access points above the spill-over level of equipment and where floor drains are installed this will be above floor level. Such access points however are of little use if located below the floor slab, in false ceilings for example, which would necessitate entry into other departments and create a nuisance if spillage occurs. Drainage manholes should not be located in the immediate vicinity of food preparation and cooking areas. Where manholes are unavoidable within the kitchen area, sealed junction fittings and air-tight flush manhole covers should be used to prevent ingress of air and egress of smells from the drainage installation. Alternatively double-cover manholes should be used.

4.41 The materials specified for drainage systems should be capable of long life under sustained conditions of use. Copper and cast-iron for above-ground and vitrified clay or cast-iron for below-ground use have been proved capable of withstanding the relatively high discharge temperatures with negligible thermal movement and have resistance to impact during rodding operations as well as being fire-resistant.

4.42 Equipment drainage outlets should not be connected directly to the drain but should discharge via a hose or tundish over a drainage channel or gully but because of cleaning problems the provision of floor channels and gullies should be minimised. Where used under boiling pans and similar equipment, channels should be laid to positive falls, with the gratings level. Gratings should be easily removable and have a corrosion resistant and non-slip finish. The need for floor channels will also be determined by the type of floor cleaning equipment likely to be used. Equipment of the power jetting type will necessitate a greater provision of channels and drainage points, which consequently may influence the floor thickness.

4.43 Grease traps are not normally installed in the drainage system but where concentrated discharges of grease-laden water occur eg dish-washing machines, a grease interceptor may be necessary. This should preferably be the enzyme-activated type which digests grease and makes it water soluble. To maintain effective operation, regular maintenance and recharging is necessary and the location should preferably be outside the building. Drains from food macerators should have short direct branches preferably into a primary drain receiving other high volume discharges upstream from the connection. Vegetable paring machines should be fitted with waste dilution chambers to avoid blockages from starch residues.

4.44 Testing and commissioning should include:

a. freedom from obstruction test, by the use of a ball inserted into the drain or other suitable method, to prove that no obstruction is present

b. water or air tests as appropriate

c. discharge tests on all appliances with appropriate appliances operating simultaneously to test for seal loss.

GAS SERVICES

4.45 A gas supply terminating in a well ventilated meter room will normally be required for the kitchen and servery area. The incoming supply should have an isolating valve and a separate departmental meter to monitor gas consumption. In combined steam and gas equipped kitchens, gas will normally serve ovens, ranges, boiling tops, grillers, and frying equipment. The dishwasher may also be heated by gas. Natural gas of calorific value 40 MJ/m^3 (1000 Btu/ft^3) and a distribution pressure of 2 kN/m^2 (8 in wg) will normally be available and most cooking equipment is now fitted with natural gas burners and controls as standard although the inclusion of pressure governors should be confirmed. Where liquified petroleum gas is used additional safety precautions are required and HSE Guidance Note CS5[26] should be consulted.

4.46 Each item of equipment should be supplied via a lever-operated isolating valve in an accessible position and isolation valves should also be provided to sectionalize all sub-main branches. To provide an automatic means of isolating the gas supply in the event of fire, a heat detector or fusible link should be located above the frying range and should initiate closure of the isolating valve at a predetermined temperature; a relay for an alarm terminal may also be required.

4.47 Gas piping will normally be in mild steel or copper although flexible tubing may be used for final connections where mobility of equipment is required. Surface runs of pipework present cleaning problems and should be minimised. Ducts or multi-service spines for accommodating pipe work should be accessible for inspection and be vented to ensure that in the event of a leak no accumulation of gas can occur. Gas installations should comply with BSCP 331 Part 3[27] and the requirements of the Gas Safety Regulations 1972.[28]

STEAM AND CONDENSATE SERVICES

4.48 Where steam is available from the main hospital supply it will normally serve boiling pans, hot closets, bains marie, boiling tables, steaming ovens and the central dishwasher. A steam pressure of about one bar (15 lbs/in^2) is normally required at the equipment inlet and a central pressure reducing station may be needed if the main supply is higher. Depending on the dryness fraction of the steam available a separator may also be required and a meter with bypass should be provided to monitor steam consumption. A readily accessible and clearly identified main steam control valve together with an isolation valve for each item of equipment should also be provided. For steam-heated dishwashers a pressure range of 650 mbar to 4000 mbar (10–60 lbs/in^2) is usually acceptable. All pipework should be insulated and adequate access for inspection and maintenance of trap assemblies provided.

4.49 All steam-operated equipment with the exception of the steaming ovens should have condense returned to the boiler house via the central condense installation. Equipment should be fitted with strainers, sight glasses and a suitable trap generally of the balanced pressure thermostatic type. Integral strainers and traps are available and this combination reduces unsightly piping connections. For steaming ovens the strainer should be omitted and the trap discharge taken via an integral grease interceptor to drain. For some types of boiling pan where steam locking is likely to occur, a ball float trap should be used.

4.50 Where, to inhibit corrosion, amine compounds are added to steam boiler installations supplying kitchens reference should be made to HTM 6[29]. Similarly where Hydrazine is used for corrosion protection the steam must not be used to supply equipment where direct contact with food is required eg steaming ovens.

TEMPERATURE CONTROLLED STORAGE

4.51 The extent of refrigerated storage will depend on the functional size of the catering department and operational policy. The main storage requirements are defined in Chapter 3 and further information is available in Engineering Data Sheet DH 2.9[30].

4.52 Purpose constructed refrigerated rooms should be well insulated, of robust construction and vermin-proof. Walls, ceilings and floors should be vapour-proof with surface finishes suitable for periodic washdown and a floor that can be easily drained. Rectangular room layouts should be simple and free from structural columns, particularly where modular cold rooms may be used. The economic thickness of insulation will depend on storage temperature and fuel cost. However, the thermal efficiency should ensure that the cooling plant total running time does not exceed 16 hours per day under normal room usage with an external ambient of 20°C. All doors should be fitted with internal safety release mechanisms and air-tight gaskets to ensure air-sealing when closed. For low temperature applications, doors should be fitted with anti-condensation heaters. In addition provision should be made for preventing partial vaccum occuring after the defrosting operation ie by the incorporation of an automatic pressure equalising device.

4.53 Cooling units either single or multi-fan discharge should be located in ceiling or side wall positions such that

good air distribution is achieved. Where it is advisable to prevent air movement when the door is open an automatic door interlock switch should stop the circulation fan. For units operating in a room temperature of −2°C or below, automatic defrost heaters should be incorporated, operated by time-clock control. Condensation lines routed to an external drain point should be traced with a heater tape.

4.54 Each cold room should have internal waterproof luminaires controlled by a switch, which overrides any automatic door switch and a battery-powered audible alarm for operation by staff who may be trapped inside. A high-limit thermostat should operate in conjunction with an external indicating light and remote audible and visual indicator. Where several refrigerated rooms are installed a central monitoring panel should be located in a continuously manned area to indicate visually and/or audibly normal/abnormal conditions and defrost operations. Particular care is necessary in monitoring temperature fluctuations in the storage of pre-cooked chilled food. A remote reading thermometer should be located outside cold rooms.

4.55 Condenser units will generally be of the unitary semi-hermetic type, with one condenser unit for each cold room except in the case of chilled holding rooms where duplicate units are preferred. To achieve optimum performance a suitable plant zone that affords good access and adequate air-cooling should be available for the siting of condenser units.

4.56 The increasing demand for refrigerated storage operating with a high load factor may offer some potential for heat reclamation. Some methods of energy conservation and recovery worth exploring are:

a. the use of heat interchangers located on refrigerant lines to improve refrigeration system performance by sub-cooling liquid refrigerant and super-heating of suction gas

b. recovery of reject heat from the refrigeration cycle for pre-heating of domestic hot water using heat exchangers in conjunction with a pre-heat vessel.

KITCHEN EQUIPMENT

4.57 The use of energy efficient equipment with a capacity for high utilisation should be encouraged. Such equipment not only reduces direct energy consumption at the point of use, but enables economies to be made in ventilation systems, boiler and electrical power consumption and facilitates the adoption of an energy-conscious management approach. All equipment should comply with the relevant British Standard and should be Gas Council or Electricity Council (ATL) approved as appropriate. It should also be designed for heavy duty, be easily maintainable, and fitted with all safety, ignition and flame failure controls necessary for its safe and efficient operation. Stainless and heat resisting steel used in equipment should have a minimum thickness of 1.6 mm (16 swg) and comply with the requirements of BS 1449[31] Part 2 Class 304 S16 or 430 S15. The surface finish of working surfaces and surfaces subject to wear shall not be less than finish 3A and the finish of decorative surfaces not less than finish 3B.

4.58 In addition to the usual selection criteria, consideration should also be given to the following aspects, which are particularly aimed at reducing excess energy consumption in kitchens:

a. improvements to ignition controls using push-button operation on gas burning appliances eg general purpose ovens, hobs and grills, to encourage switching off when not in use

b. enhanced casing insulation for ovens, boiling pans, bains-marie and dishwashers to reduce surface heat emission and improve operational safety

c. the incorporation of timers on grillers, general purpose ovens, and vegetable preparation machines to reduce over-running when the appliance is not in use

d. the incorporation in dishwashing machines of:
   i. integral rinse water heaters
   ii. rinse water economisers to reduce domestic hot water usage, by shutting off rinse water when not required
   iii. exhaust ventilation condensers for recovery of exhaust heat to pre-heat cold feed water with or without heat pump operation

e. judicious selection of boiling pans (quantity and capacity) to encourage high utilisation

f. greater emphasis on the use of energy efficient bratt pans and high speed steamers

g. fuel selection based on the cost of the energy at the point of use; the magnitude of the heat conversion and distribution losses can often equal that of the useful energy consumed.

ELECTRICAL SERVICES

4.59 The installation shall comply with the current IEE 'Regulations for Electrical Installations'[32] and conform to the requirements of HTM 7[9]. The installed electrical capacity and maximum demand will depend primarily on the proportions of other fuels used for the catering process. For initial design purposes the figure included in paragraph 4.11 may be used.

4.60 A factor in the determination of the incoming supply arrangement will be the supply tariff. Where a catering/cooking tariff is available and cost effective a separate metered supply will be required from the site incoming supply point. For other tariffs a locally metered supply for the catering department will be required from the site distribution system.

Emergency electrical supplies (see also paragraph 4.10)

4.61 Guidance on the provision of emergency electrical supplies is given in HTM 11[33] and the grade of standby lighting provision is shown on the Activity Data 'A' sheets. Safety lighting in accordance with HTM 11[33] and BS 5266[34] should be provided on primary escape routes.

4.62 All socket outlets for refrigerators and supplies to cold rooms, and a selection of electric food preparation equipment eg slicers, mixers, blenders, peelers, etc, should be taken from essential circuits. To allow the processing of food in gas or steam heated equipment to continue during electric power disruptions all electrically operated controls eg timers, over-fans, flame failure pro-

tection devices etc should also be supplied from essential circuits.

Electrical installation

4.63 The wiring installation using PVC cables in heavy gauge screwed steel conduit or mineral insulated metal-sheathed cable should be concealed wherever possible within walls, ceilings or service spines. Where exposed cables in food preparation areas are unavoidable they should be PVC sheathed and installed to minimise the accumulation of dirt and to facilitate cleaning eg using stand-off plastic clips or non-ferrous brackets.

4.64 Every permanently connected item of equipment shall have an isolating switch separate from and additional to any switch fitted to the equipment. In food processing areas every group of socket outlets should have an isolating switch separate from and additional to any integral socket outlet switch. The purpose of the separate, additional, isolating switch is for:

a. emergency isolation of the equipment in the event of, a fire, serious spillage, or steam leak etc

b. isolation of the equipment on completion of a cooking or preparation session to obviate the danger of fire and to permit safe cleaning.

4.65 Isolating switches should be installed in convenient and safe locations not subject to heat or splashing and those connected to essential circuits should be clearly labelled. Electrically heated equipment and all equipment that is automatically controlled eg refrigerators, should be provided with a pilot lamp to indicate when the equipment is energised. The lamp should be incorporated in the control panel of the apparatus, in the control switch or in the ring main outlet from which the apparatus derives its supply.

4.66 The final connection to each item of equipment should permit withdrawal and/or removal of the item for cleaning or repair and where appropriate the conductors should have heat-resisting insulation. Wherever appropriate, individual items of equipment or circuits serving groups of equipment should be fitted with time-switches to:

a. reduce overall energy consumption by ensuring that the equipment is only energised for the period it is required

b. facilitate the reduction of simultaneous peak loads and so reduce maximum demand charges.

4.67 Electrically operated catering equipment should not be mounted on mobile or movable metal tables or benches. Industrial pattern plugs and sockets should be used to connect equipment used in onerous situations eg rotary pan-wash brushes or plug-in mobile equipment associated with the patients' tray conveyor.

4.68 Vacuum cleaning and floor scrubbing appliances with flexible leads nine metres long should be assumed and socket outlets, usually in circulation spaces, should be provided to enable such machines to operate over the whole area of the accommodation.

Lighting

4.69 Practical methods of lighting the various functional spaces are contained in the CIBS Lighting Guide[35] and the Lighting Code[36]. The choice of luminaire (lighting fitting) should take account of the requirements of light distribution, and visual comfort appropriate to the space particularly in food processing and servery areas where equipment surfaces have a high reflectance. Luminaires should be of a type which are easily cleaned and maintained and in food handling areas should be totally enclosed to avoid adulteration from lamp breakage. Their location should be readily accessible for lamp changing and maintenance but with the overriding requirement that the recommended standard of illumination is provided to the task areas. Light sources with acceptable colour rendering characteristics will be required in food handling and display areas. HN(85)20[37] describes some high efficiency fluorescent lamps with good colour rendering properties which are suitable for general use within this department.

4.70 Illuminating task areas under extract canopies presents a particular problem. It is often difficult to illuminate adequately the equipment under a canopy using externally located luminaires and the temperature and humidity within the canopy may have a detrimental effect on the performance of internally located luminaires. At high temperatures the efficiency of fluorescent lamps is lowered, the life of control gear may be seriously reduced and plastic diffusers may soften and deform. Additionally luminaires under exhaust canopies must be vapour-proof and suitable for frequent cleaning. If the canopy is constructed using wired-glass the installation of internally mounted luminaires is unnecessary and should be avoided. Where the canopy panels are non-transluscent, totally enclosed fluorescent luminaires conforming with IP 31 (BS 4533)[38] should be located on the perimeter of the canopy and if this arrangement is not practical then internally mounted tungsten or compact fluorescent bulkhead luminaires should be used. In all cases the suitability of the luminaires for the ambient conditions should be confirmed with the manufacturer.

4.71 Fluorescent luminaires used in refrigerated stores must be suitable for low temperature operation and because these special fittings may still take several minutes to reach full output they should be time-switch controlled to suit local working arrangements. Luminaires used in these locations which add significantly to the cooling load however should be controlled by an automatic door switch. The use of mineral insulated PVC sheathed cables will avoid the condensation problems usually associated with conduit systems in this situation and lighting controls and power outlets should be located outside cold rooms.

4.72 The lighting design for dining rooms and coffee lounges should provide a welcoming and relaxing atmosphere and a contrast to the normal hospital working environment. Luminaires should be decorative but reasonably easy to clean and selected to co-ordinate with the furnishings and decor. Switching should be as flexible as practicable to allow partial use of the kitchen and dining areas outside the main working periods and to facilitate security checks.

Fire alarm and detection system

4.73 The Fire Alarm and Detection System should be in accordance with HTM 82[2]. Fire alarm sounders (particu-

larly bells) should be clearly distinguishable from other audible alarms eg cold rooms.

Electric clocks

4.74 Clocks should operate in conjunction with a master clock system. If such a system is not available synchronous clocks should be installed using a common clock circuit suitable for future connection to a master system.

Wireways for telephones

4.75 Telephone requirements are indicated on the relevant Activity Data Sheets and wireways should be provided accordingly. Pay telephones should be provided in or adjacent to the dining room and/or coffee lounge.

Staff location system

4.76 The staff location system employed in the hospital should be extended to cover this department. Guidance on these systems is given in HTM 20[39].

Finishes

4.77 In food preparation and processing areas, lighting switches and 13A power circuit accessories should have corrosion-resistant metal plates and fixings. Exposed metalwork of other electrical apparatus should be suitable for frequent cleaning.

Lightning protection

4.78 Protection against lightning should be provided in accordance with HTM 7[9] and Engineering Data Sheet DB 2[40].

Engineering References

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19. **British Standards Institution.** BS 2831: 1971. Methods of test for air filters used in air conditioning and general ventilation. 44pp.
20. **British Standards Institution.** BS 800: 1977. Specification for interference limits and measurements for equipment embodying small motors, contacts, control and other devices causing similar interference. 28pp.
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23. **British Standards Institution.** BS 5423: 1977. Specification for portable fire extinguishers. 16pp.
24. **British Standards Institution.** BS 5572: 1978. Code of Practice for sanitary pipework (formerly CP 304). 56pp.
25. **Department of Health and Social Security.** Horizontal and vertical drainage access and accommodation. (Hospital Service Engineering Data Sheet EA 5.1) London, DHSS, 1975/1978. 19pp.
26. **Health and Safety Executive.** Guidance Note CS 5. The storage of liquified petroleum gas at fixed installations. London, HMSO.
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5 Cost information

5.1 For all types of health buildings it is clearly of vital importance that building costs and revenue expenditure should be kept as low as possible consistent with acceptable standards. Within this general context building notes provide a synopsis of accommodation for health buildings which the Department, in conjunction with the National Health Service, recommends for the provision of a given service.

Options

5.2 This Note, where appropriate, draws attention to alternative ways of providing services or facilities, including the likely cost implications. This information will enable project teams to select the solution which is most suitable to their needs. The options covered in this Note are as follows:

a. 600 meal kitchen as phase 1 of 1200 meal kitchen

b. 300 meal dining room as phase 1 of 600 meal dining room.

c. Bulk store for 600 meal kitchen as phase 1 of 1200 meal kitchen.

d. Storekeeper's office.

The provision of dieticians' offices and test kitchen has not been costed.

Cost allowance

5.3 To prepare the cost allowance for a scheme reference should be made to the current edition of Appendix 7 to Hospital Building Procedure Note 6—Capricode. The total Departmental Cost Allowance for any scheme is derived by aggregating the cost of the functional units and options as appropriate to the particular scheme. An example is given in the Health Notice associated with this Note.

5.4 The cost allowance covers the building and the engineering guidance set out in this Note. The costing of the functional units assumes that they will be incorporated into a whole hospital to form a complete department.

5.5 The functional units in this Note are:

a. Kitchen
   i. 600 meals
   ii. 600 meals as phase 1
   iii. 1200 meals

b. Dining Rooms
   i. 300 meals
   ii. 300 meals as phase 1
   iii. 600 meals

c. Serveries
   i. 300 meals
   ii. 300 meals as phase 1
   iii. 600 meals

d. Bulk store
   i. 600 meal kitchen
   ii. 600 meal kitchen as phase 1
   iii. 1200 meal kitchen

Schedules of activity spaces for each functional unit are provided at the end of this chapter.

Costing other functional units (see paragraph 2.66)

5.6 It is recognised that many catering departments will not conveniently fall within the three functional units proposed. Costs of meeting seating requirements are directly proportional to the number of meals served (1.13) but the cost of kitchens, serveries and refrigerated storage is not. In these cases, because equipment forms a substantial proportion of the capital cost, detailed examination of the elemental costs will be required. In addition it is essential to consider whether there are disproportionate effects on the provision of engineering and environmental services. There are special problems with functional units below 500 meals and above 1300 meals.

Dimensions and areas

5.7 In determining spatial requirements, the essential factor is not the total area provided but the critical dimensions, ie those dimensions critical to the efficient functioning of the activities which are to be carried out. There are therefore no recommended areas associated with the schedules of activity spaces. To assist project teams in preparing detailed design solutions for the rooms and spaces, the Department has carried out studies to establish dimensional requirements in the form of critical dimensions. The results of these studies appear as ergonomic diagrams in the Appendix of this Note and in the draft Health Building Note 'Common Activity Spaces', which has been made available to Regional Health Authorities as a working document.

5.8 It is recognised that for development planning and at the earliest stage of a departmental design it may be convenient for designers to have data available which enables them to make an approximate assessment of the sizes involved. For this reason the schedules of areas, prepared for the purpose of establishing the cost allowance, are included with the Health Notice promulgating the Departmental Cost Allowance for this Note. It is emphasised that the areas published DO NOT represent recommended room sizes nor specific individual entitlements.

Circulation

5.9 The schedule of areas used for costing (5.8) will have an area for circulation within each functional unit, shown as an addition. It should be noted that for convenience the areas allowed for planning provision, engineering zone and for partitions, are included in the area allowed for circulation.

Kitchen

5.10 The cost allowance for the three sizes of kitchen allows for storage, cold and chill rooms, preparation, cooking area, washing-up, tray service, bulk trolleys, offices and staff facilities which are shown on the schedule of spaces. A diet preparation and cooking area is also allowed.

Bulk storage

5.11 A separate cost has been provided for three sizes of bulk stores to enable a local policy decision to be made on the location of these facilities, eg whether to centralize all stores or locate them on another floor. The cost implications of locating the bulk stores away from the kitchen should be fully considered.

Staff dining room

5.12 Cost allowances are provided for three sizes comprising restaurant and coffee lounge, sanitary facilities, offices and cleaners' room. A furniture store is included as Essential Complementary Accommodation (ECA).

Serveries

5.13 A separate cost has been provided for the three sizes of staff dining rooms and comprises two serveries one for the restaurant and the second for the coffee lounge.

Communications

5.14 The following are not included in the cost allowance:

a. a loading bay

b. plant rooms, with the exception of an electrical switchroom and a gas meter room.

Engineering services

5.15 The following engineering services as described in the Engineering Chapter and exemplified in Activity Data are included in the cost allowances for this department. Primary engineering services are assumed to be conveniently available at the boundary of the department.

a. ***Mechanical Services***

Potable water, cold water services and hose reel piping to take off points (storage tanks and hose-reels excluded). Flow meter on potable water supply.

LTHW radiator/convector heating system with touch temperature not exceeding 82° including limited anti-condensation heating in individual rooms not provided with mechanical ventilation.

The domestic hot water supply at 60° (storage excluded) with provision for flow meters.

Zoned variable volume kitchen ventilation system with automatic and manual override controls for flexibility of operation and maximum economy. Separate extract system provided for fryer hood, dish wash machines and toilet extract systems.

Separate supply and extract systems for call order and coffee lounge.

Steam and gas mains for kitchen equipment, provided with flow meters.

Automatic controls for heating system and remote sensor thermostatic radiator valves where appropriate.

Thermal insulation for services to latest DHSS requirements.

Dishwash machines with energy recovering condensers in the exhaust system to preheat treated water for the rinse system.

b. ***Electrical Services***

Departmental distribution switchboard.

Equipotential bonding as required.

General lighting as required by tasks. Fluorescent, tungsten and emergency lighting fittings as appropriate.

Socket outlets and other power outlets for fixed and portable equipment with industrial type outlets where required.

Standby lighting and power requirements. Safety lighting for escape routes.

Impulse clocks.

Fire and cold room alarm systems.

Conduits only for telephones.

Staff location extension to hospital system.

Door bell.

Provision for time control of catering equipment.

Facilities for metering.

c. ***(Group 1) Equipment***

Insect traps, refrigeration, catering, serving, wash-up and disposal equipment.

Central Kitchens

ACTIVITY SPACE	*600 MEALS*	*600 MEALS AS PHASE I*	*1200 MEALS*
BASIC ACCOMMODATION	No	No	No
1. Check weigh	1	1	1
2. Refuse store	1	1	1
3. Store—daily use	1	1	1
4. Vegetable store	1	1	1
5. Meat cold room	1	1	1
6. Kitchen blast chilling bay	1	1	1
7. Kitchen chilling room	1	1	1
8. Kitchen cold room	1	1	1
9. Kitchen frozen food store	1	1	1
10. Equipment store	1	1	1
11. Dry disposables' store	1	1	1
12. Vegetable preparation	1	1	1
13. Meat, fish and poultry preparation	1	1	1
14. General preparation	1	1	1
15. Pastry, preparation and cooking	1	1	1
16. Diet—preparation and cooking	1	1	1
17. Cooking area	1	1	1
18. Pan wash	1	1	1
19. Kitchen superintendent's office	1	1	1
20. Patients' tray service	1	1	1
21. Patients' tray preparation	1	1	1
22. Meal service supervisor's office	1	1	1
23. Catering manager's office	1	1	1
24. Assistant catering manager's office	1	1	1
25. Catering office—clerks	1	1	1
26. Trolley parking—dirty	1	1	1
27. Trolley wash	1	1	1
28. Trolley parking—clean	1	1	1
29. Central wash-up	1	1	1
30. Detergents' store	1	1	1
31. Cleaners' room	1	1	1
32. Staff rest room	1	1	1
33. Staff changing and sanitary facilities male	1	1	1
34. Ditto— female	1	1	1
35. Electric switch room	1	1	1
36. Gas meter room	1	1	1
Circulation etc			

Bulk Provision Store

ACTIVITY SPACE	*600 MEALS*	*600 MEALS AS PHASE I*	*1200 MEALS*
BASIC ACCOMMODATION	No	No	No
1. General storage	1	1	1
2. Bread store	1	1	1
3. Fats and cheese store	1	1	1
4. Milk cold room	1	1	1
5. Frozen food store	1	1	1
Circulation etc			

Option

ACTIVITY SPACE	*No*
1. Storekeeper's office	1
Circulation etc	

Staff Dining Rooms

ACTIVITY SPACE	*300 MEALS*	*300 MEALS AS PHASE I*	*600 MEALS*
BASIC ACCOMMODATION	No	No	No
1. Entrance lobby	1	1	1
2. Restaurant	1	1	1
3. Coffee lounge	1	1	1
4. Pantry/food store	1	1	1
5. Dining room supervisor's office	1	1	1
6. Linen and disposable goods store	1	1	1
7. Cleaners' room	1	1	1
8. Electric switch cupboard	1	1	1
Circulation etc			
Serveries—Staff Dining			
1. Restaurant servery	1	1	1
2. Coffee lounge servery	1	1	1
Circulation etc			

Essential Complementary Accommodation

ACTIVITY SPACE	*No*
1. Furniture store	1
Circulation etc	

6 Activity Data

6.1 The expression 'Activity Data' refers to an information system developed to help project and design teams by defining the users' needs more precisely. This information constitutes the Activity Data Base, issued to Regional Health Authorities in England and to the Health Departments in Scotland, Northern Ireland and Wales in 1976, and comprises two types of information sheet: Activity Space Data Sheets (known as 'A' sheets) and their supporting Activity Unit Data Sheets (known as 'B' sheets).

6.2 'A' sheets record in more detail than elsewhere in this Note each task or activity that is performed in a particular activity space (which may be a room, space or bay) together with details of the environmental conditions and technical data necessary to enable the activities to be performed. Each 'A' sheet also contains a list of the titles and code numbers of the relevant 'B' sheets which give both in narrative text and in graphics to scale, equipment fitted or supplied as part of the building and engineering terminals which satisfy the required user activities.

6.3 Further information about the use and preparation of Activity Data can be found in the 'Guide to 'A' and 'B' Activity Data Sheets and their use in Health Building Schemes' issued to Regional Health Authorities in England in June 1980, and to the NHS Authorities in Wales in November 1980. Copies of the Guide are available from the Department's Directorate of Works Development, Branch Dev 1.2, Euston Tower, 286 Euston Road, London NW1 3DN.

Activity data applicable to this Note

6.4 The 'A' and 'B' sheets recommended for the activity spaces described in this Note have been newly prepared or selected from existing sheets. Their code numbers and titles are provided on the lists which follow.

6.5 Further Activity Data sheets may be selected, or drawn up by project teams to their own requirements, for any services not described in the Note or included in the list. Members of project teams are advised to contact their Regional Activity Data Co-ordinator/Welsh Office for information and advice about the selection of activity data at an early planning stage. However, in order to ensure consistent and economic provision, variations from the 'A' sheets recommended for the spaces covered in this Note should be considered only where it has been decided that the function of a space will differ substantially from that described.

List of Activity Data 'A' sheets

Activity Space	*'A' sheet code No*		*para no in BN*
1. Check weigh	W0402		3.3
2. Refuse store	W0401		3.6
3. Store—daily use	W0408	W0409	3.20
4. Vegetable store	W0407		3.14
5. Meat cold room	W0412		3.15
6. Blast chilling bay	W0424	W0423	3.17
7. Chilled store	W0422	W0421	3.16
8. Kitchen cold room	W0410	W0415	3.18
9. Kitchen frozen food store	W0420	W0419	3.19
10. Equipment store	W0403		3.21
11. Catering disposables	W0425		3.22
12. Preparation of vegetables/ salads/fruits	P0118	P0117	3.29
13. Preparation of raw meat/ fish/poultry	P0120	P0119	3.30
14. General preparation	P0116	P0115	3.31
15. Pastry preparation	P0114	P0113	3.32
16. Diets—preparation/cooking	P0208	P0205	3.33
17. Cooking area	P0207	P0206	3.34
18. Pan wash	P0407		3.51
19. Kitchen superintendent's office	M0517		3.52
20. Patients tray service space	P0308	P0307	3.55
21. Patients tray preparation bay	P0306	P0305	3.57
22. Meals service supervisor's office	M0506		3.59
23. Catering manager's office	M0516		3.87
24. Assistant catering manager's office	M0503		3.87
25. Clerical office	M1002	M1003	3.87
26. Trolley parking—dirty	G0304		3.63
27. Trolley wash	P0408		3.64
28. Trolley parking—clean	G0303		3.62
29. Central wash-up	P0406	P0405	3.65
30. Detergents' store	W0418		3.68
31. Cleaners' space	Y1205		3.69
32. Catering staff rest room	D0501	D0502	3.89
33. Staff changing—male	V0413	V0415	3.88
34. Staff WC—male	V1007		
35. Staff shower—male	V1616		
36. Staff changing—female	V0412	V0414	
37. Staff WC—female	V1019		
38. Staff shower—female	V1616		
39. Switchroom	K0101		3.90
40. Gas meter room	K0401		3.91

List of Activity Data 'A' sheets (cont)

Activity Space	*'A' sheet code No*		*para no in BN*
Bulk provision store			
1. General storage	W0404	W0405	3.7
2. Bread store	W0406	W0426	3.8
3. Fats and cheese store	W0414		3.10
4. Milk cold room	W0411		3.11
5. Frozen food store	W0416	W0413	3.12
Optional			
1. Storekeeper's office	M0518		3.4
Staff Restaurant			
1. Entrance lobby	J1127	J1128	3.71
2. Staff dining room	F0121	F0122	3.76
3. Coffee lounge	F0404	F0405	3.80
4. Pantry/food store	W0427		3.74
5. Dining room supervisor's office	M0519		3.75
6. Linen and disposable goods store	W0417		3.85
7. Cleaners' room	Y1208		3.83
8. Switchroom	K0101		3.90
Serveries			
1. Servery—dining	F0206	F0207	3.72
2. Servery—coffee lounge	F0303	F0304	3.82
Essential Complementary Accommodation			
1. Furniture store	W0428		3.84

List of Activity Data 'B' sheets

'B' Sheet code No			*Activity Unit Title*
B02BI	Cleansing	—	Sink unit cupboard
B04AM	Storage	—	Safe small
B04BX	Storage	—	Cupboard, 1000 × 900 × 450 mm steel small
B04BY	Storage	—	Cupboard, 1800 × 900 × 450 mm steel lockable
B04GA	Storage	—	Cupboard, 600 × 1200 × 300 mm wall mounted
B05BK	Preparation/ Storage	—	Worktop, 1200 × 600 mm, 2 drawers, 2 cupboards under
B16AC	Communication	—	Telephone, coin operated and hood with shelf and hinged directory rack
B15AH	Secretarial	—	Typists desk unit with telephone
B14AY	Administration	—	Single pedestal desk with chair, telephone and socket outlet
B20AL	Recording	—	Writing flap, 600 × 400 mm
B20A0	Recording	—	Scales, self indicating platform
B23AF	Information Technology	—	Mini computer, hard disc, VDU and printer
B27AU	Toilet	—	WC, staff, male
B27AV	Toilet	—	WC, staff, female
B27BC	Toilet	—	Handrinse basin single
B27CU	Toilet	—	ST vending machine

List of Activity Data 'B' sheets (cont)

'B' Sheet code No			*Activity Unit Title*
B27EB	Toilet	—	Handrinse basin single work area
B27GF	Toilet	—	Shower staff without personal washing facilities
B27FL	Toilet	—	Personal washing, lavatory basins range 2
B31EW	Parking	—	Tray rack 1800 × 1000 × 700 mm mobile
B31GQ	Parking	—	Cash register
B02BI	Cleansing	—	Sink unit cupboard
B52AA	Cleansing	—	Sink unit
B53AA	Catering	—	Cleansing, dishwasher, automatic Flight type 21
B53AC	Catering	—	Cleansing, sink mobile
B53AE	Catering	—	Cleansing, food trolley wash
B53AG	Catering	—	Cleansing, pre-wash soak, with worktop
B53AH	Catering	—	Cooking, storage cupboard, ss, heated for food containers
B53AI	Catering	—	Cooking, air convection oven
B53AJ	Catering	—	Cooking, oven, heavy duty, open top, gas
B53AK	Catering	—	Cooking, oven, heavy duty, solid top, gas
B53AO	Catering	—	Cooking, grill, twin eye level with worktop
B53AR	Catering	—	Cooking, fryer, shallow fitting
B53AS	Catering	—	Holding/cooking bain marie open top
B53AY	Catering	—	Preparation scales, 10 kg capacity on worktop
B53BB	Catering	—	Storage/preparation, storage worktop, tray slides under, three shelves over
B53BD	Catering	—	Parking, vegetable rack mobile
B53BF	Catering	—	Parking, pan rack 4 tier 1500 × 1200 × 600 mm mobile
B53BG	Catering	—	Parking, rack 6 tier 1200 × 600 × 600 mm mobile
B53BH	Catering	—	Parking, tray rack 1800 × 900 × 600 mm mobile
B53BN	Catering	—	Parking, plate, assembly dispenser double heated
B53BO	Catering	—	Parking, plate lid dispenser triple heated
B53BP	Catering	—	Parking, plate dispenser double heated 180 mm plates
B53BQ	Catering	—	Parking, plate dispenser double heated 230 mm plates
B53BR	Catering	—	Parking, plate dispenser triple unheated saucers
B53BS	Catering	—	Parking, plate dispenser double unheated 152 mm plates
B53BT	Catering	—	Parking, tray dispenser basket, mobile
B53BU	Catering	—	Parking, tray/basket dispenser, mobile
B53BW	Catering	—	Parking, bain marie heated cabinet, mobile
B53BX	Catering	—	Parking, bain marie electric mobile
B53BY	Catering	—	Parking, basket dispenser heated mobile

List of Activity Data 'B' sheets (cont)

'B' Sheet code No			*Activity Unit Title*
B53BZ	Catering	—	Duckboard, plastic non-slip interlocking
B53CC	Catering	—	Disposal, food waste disposal unit, 5 hp, with worktop
B53CG	Catering	—	Counter unit bain marie 4 compartments
B53CH	Catering	—	Refrigerated counter unit cold food
B53CN	Catering	—	Preparation, worktop, ss, with shelf under
B53CO	Catering	—	Preparation, worktop with sink and mobile disposal bin
B53CP	Catering	—	Preparation, worktop with sink and shelf under
B53CR	Catering	—	Preparation, slicer, electric, automatic, gravity feed, on worktop
B53CV	Catering	—	Preparation, worktop diet preparation
B53CY	Catering	—	Preparation, slicer, electric, continuous feed
B53CZ	Catering	—	Preparation, mincer, electric, large on worktop
B53DA	Catering	—	Chopping block and stand
B53DF	Catering	—	Preparation, mixer, 50 qt, floor mounted
B53DG	Catering	—	Preparation, mixer, 30 qt, floor mounted
B53DH	Catering	—	Preparation, mixer, 20 qt
B53DK	Catering	—	Preparation, tray conveyor service
B53DM	Catering	—	Preparation, electric potato chipper with stand, mobile
B53DW	Catering	—	Refrigerated storage, cold room, with shelves for fats, 1200 meals
B53DX	Catering	—	Refrigerated storage, cold room, 15 m^3, 1200 meals
B53DY	Catering	—	Refrigerated storage, cold room kitchen 20 m^3, 1200 meals
B53EA	Catering	—	Refrigerated storage, kitchen frozen food store, 20 m^3
B53EM	Catering	—	Counter serving cleansing sink unit
B53EU	Catering	—	Counter unit cutlery and drinking water self service
B53EX	Catering	—	Proving oven
B53EY	Catering	—	Preparation, dough divider
B53EZ	Catering	—	Taps hot and cold, wall mounted
B53FC	Catering	—	Refrigerated storage, cold room 20 m^3 vegetable and salad store, 1200 meals
B53FD	Catering	—	Display menu boards
B53FG	Catering	—	Counter servery, beverages cold unit
B53FH	Catering	—	Cooking, griddle electric
B53FI	Catering	—	Cooking, fryer deep electric
B53FJ	Catering	—	Cooking, grill electric
B53FK	Catering	—	Cooking, boiling top electric 4 disc
B53FL (MOD)	Catering	—	Counter servery, beverages hot unit
B53FN	Catering	—	Preparation, storage worktop with cupboards over and under
B53FP	Catering	—	Preparation, storage worktop with cupboards under
B53FQ	Catering	—	Worktop and tray slides
B53FR	Catering	—	High speed steamer
B53FW	Catering	—	Steaming oven, 2 compartments
B53GC	Catering	—	Mobile tank
B53GE	Catering	—	Bain marie counter unit, 6 compartments
B53GI	Catering	—	Cleansing, wash and sterilizing sinks, with worktop
B53GJ	Catering	—	Cleansing, sink and worktop with shelf under
B53GK	Catering	—	Cleansing, high pressure washer unit
B53GM	Catering	—	Cooking, fryers deep with worktop, 3 × 4 galls capacity
B53GN	Catering	—	Cooking, grill, eye level, with worktop
B53GO	Catering	—	Cooking, round boiling pan 30 gall
B53GP	Catering	—	Cooking, round boiling pan 20 gall
B53GR	Catering	—	Cooking, round tilting boiling pan, 3 × 10 gall
B53GS	Catering	—	Cooking, 4–6 burner heavy duty
B53GT	Catering	—	Cooking, pastry oven, two deck
B53GW	Catering	—	Preparation, pastry, worktop
B53GX	Catering	—	Preparation, pastry finishing
B53GY	Catering	—	Preparation, pastry finishing worktop with shelf over
B53GZ	Catering	—	Preparation, potato peeler, 28 lbs
B53HA	Catering	—	Preparation, worktop with sinks and bench mill, 900 × 3600 × 600 mm
B53HB	Catering	—	Storage preparation, worktop, baking tray slides, shelf under
B53HC	Catering	—	Parking dispenser, crockery baskets mobile
B53HD	Catering	—	Parking, bain marie electric mobile
B53HG	Catering	—	Refrigerated storage, chilling room 17 m^3
B53HH	Catering	—	Refrigerated storage, chilling room 20 m^3
B53HJ	Catering	—	Blast chiller 40 kg/hr pass through type
B53HK	Catering	—	Blast chiller 80 kg/hr pass through type
B53HL	Catering	—	Disposal waste compactor
B53HM	Catering	—	Fly killer, electric wall mounted
B53HN	Catering	—	Preparation worktop, ss, with shelf under 900 × 1400 × 600 mm
B53HO	Catering	—	Preparation worktop, ss, with shelf under 900 × 2000 × 600 mm

List of Activity Data 'B' sheets (cont)

'B' Sheet code No			*Activity Unit Title*
B53HP	Catering	–	Warming cabinet, 1200 mm
B53HQ	Catering	–	Dispenser milk, 3 gall refrigerated
B53HX	Catering	–	Dispenser milk, 5 gall refrigerated
B53HR	Catering	–	Cold counter unit, with half width display case over
B53HY	Catering	–	Cold counter unit, with full width display case over
B53HS	Catering	–	Counter cashiers unit
B53HT	Catering	–	Two toasters, 220 × 460 × 220 mm
B53HU	Catering	–	Microwave oven, 400 × 600 × 500 mm
B53HV	Catering	–	Catering preparation worktop
B53HW	Catering	–	Catering preparation worktop with storage cupboard over
B53JA	Catering	–	Bin storage aluminium
C01CC	Clothes storage	–	Locker; clothes, twin, 1800 × 400 × 550 mm
C01HA	Clothes storage	–	Stand; hat, coat and umbrella, 12 hangers
C01HF	Clothes storage	–	Rack, motorcycle helmet, lockable, three helmets
C03CB	Clothes storage	–	Hook, hat and coat 2
C03CC	Clothes storage	–	Hook, hat and coat, 3
C03CD	Clothes storage	–	Hook, hat and coat, 4
C03FD	Clothes storage	–	Clip, equipment 6
C04CA	Chairs	–	Chair; stacking, without arms
C04CO	Chairs	–	Chair; semi easy, modular unit, 600 × 600 mm
C04CP	Chairs	–	Chair; semi easy, modular unit, corner, 600 × 600 mm
C07DE	Bench seating	–	Seating banquette 420 × 1200 × (380 + 150) 530
C09EG	Tables	–	Table, refectory, with tray shelf 710 × 1800 × 710 mm
C09EH	Tables	–	Table, refectory, with tray shelf 710 × 1200 × 710 mm
C09EJ	Tables	–	Table, ss, with shelf, 900 × 1800 × 600 mm
C09FA	Tables	–	Table, occasional, square, 400 × 600 × 600 mm
C09FD	Tables	–	Table, occasional, round, 405 × 600 mm diameter
C09HE	Tables	–	Banquette table, 700 × 1200 × 720 mm
C09IA	Tables	–	Table, mobile, 710 × 1500 × 600 mm, with shelf
C09IB	Tables	–	Table, ss, top and shelf, mobile, 900 × 900 × 600 mm
C09JM	Tables	–	Plant stand
C10CC	Worktops	–	Worktop, 600 mm wide × 1200 mm length
C10CD	Worktops	–	Worktop, 600 mm wide × 1300 mm length
C10CO	Worktops	–	Worktop, 600 mm wide × 2400 mm length
C12CC	Disposal containers	–	Holder sack, large, freestanding
C12FC	Disposal containers	–	Holder sack, large, foot operated, mobile
C12GC	Disposal containers	–	Bin, disposal, general purpose, with lid
C12GE	Disposal containers	–	Bin, storage, aluminium, mobile, 762 × 426 × 426 mm
C12HA	Disposal containers	–	Ashtray, pedestal
C13CE	Book/magazine storage	–	Bookcase, hinged wood doors, lockable 1000 × 1200 × 300 mm
C17CA	Mirrors	–	Mirror, wall mounted 1500 × 400 mm
C17CB	Mirrors	–	Mirror, wall mounted 600 × 300 mm
C18CA	Display panels	–	Panel, display, wall mounted 800 × 600 mm
C18CB	Display panels	–	Panel, display, wall mounted 800 × 1200 mm
C18GA	Display panels	–	Board, menu, 800 × 1200 mm
C18GC	Display panels	–	Board, menu, interchangeable panels 1200 × 1000 mm
C20CD	Marker board	–	Marker board, wall mounted, 1200 × 600 mm
C23CB	Document storage	–	Cabinet filing, 4 drawer
C30AC	Parking	–	Parking, sack truck
C31CB	Trolleys	–	Trolley, general purpose, 2 tier, buffered
C31DB	Trolleys	–	Trolley, clearing
C31DD	Trolleys	–	Trolley, food service, 36 trays unheated
C31DF	Trolleys	–	Trolley, bread, 5 tier
C31DG	Trolleys	–	Trolley, food, heated
C31DH	Trolleys	–	Trolley, milk crate
C31DI	Trolleys	–	Trolley, provision, closed, 5 tier
C31DJ	Trolleys	–	Dolly, tray, 450 × 350 mm trays
C31DK	Trolleys	–	Dolly, crockery basket, 500 × 500 mm
C31DM	Trolleys	–	Trolley, pantry, 3 tier, 900 × 450 × 450 mm
C31DN	Trolleys	–	Trolley, tray, self cleaning, single tier 535 × 330 × 1420 mm – 10 trays
C31DP	Trolleys	–	Trolley, tray, self cleaning, (side by side) 1070 × 330 × 1420 mm – 20 trays
C31DR	Trolleys	–	Trolley, tray, self cleaning, (side by side) 1605 × 330 × 1420 mm – 30 trays
C31KO	Trolleys	–	Dolly, tray/crockery basket 560 × 457 mm
C31KP	Trolleys	–	Dolly, tray/crockery basket 650 × 70 mm
C31KR	Trolleys	–	Trolley, catering reject tray 610 × 508 mm × 900 mm
C31KS	Trolleys	–	Trolley, storage, 4 tier, 1200 × 900 × 600 mm
C31KT	Trolleys	–	Trolley, baking trays for convection oven
C31GE	Trolleys	–	Linen trolley, soiled linen, single ring
C31KF	Trolleys	–	Special purpose trolley, cleaner

List of Activity Data 'B' sheets (cont)

'B' Sheet code No			*Activity Unit Title*
C32CE	Racking	—	Racking, metal, 1 bay, 4 shelves, 1800 × 1200 × 900 mm
C32CF	Racking	—	Racking, ss, metal, 1 bay, 4 shelves, 1800 × 1200 × 600 mm mobile
C32CG	Racking	—	Racking, metal, 2000 × 914 × 305 mm
C32CK	Racking	—	Racking, metal, 2000 × 914 × 600 mm, 1 bay, 4 shelf
C32CP	Racking	—	Racking, ss, 1 bay, 4 shelves, 1200 × 450 mm mobile
C32CQ	Racking	—	Racking, ss, 1 bay, 4 shelves, adjustable, mobile, 1400 × 1200 × 600 mm
C33EB	Shelving	—	Shelf, square ends with 3 brackets, 1200 × 300 mm
C33GB	Shelving	—	Shelf, square ends with brackets, 1800 × 300 mm
C33NC	Shelving	—	Shelf, square ends with brackets, 1400 × 300 mm
C34AB	Storage	—	Storage, platform 300 × 900 × 900 mm
C34AC	Storage	—	Storage, pallet, 125 × 1200 × 800 mm
C38CE	Refrigerated storage	—	Refrigerator, 10 cu ft, 1500 × 700 × 700 mm
C38CI	Refrigerated storage	—	Refrigerator, reach in type, electrically operated, 17.1 cu ft
C38CK	Refrigerated storage	—	Refrigerator, 21 cu ft top motor, electrically operated, auto defrost
C38DA	Refrigerated storage	—	Refrigerator, fish, 6 drawers, 14 stone capacity
C38FF	Refrigerated storage	—	Deep freeze, cabinet 17 cu. ft, 1830 × 740 × 820 mm
C38GA	Refrigerated storage	—	Conservator, ice cream, 4 cu ft
C38GB	Refrigerated storage	—	Dual temp. unit, 10/10 cu ft, combined deep freeze/ refrigerator
C52CA	Cleaning equipment	—	Cleaner, vacuum, industrial, small
C52CB	Cleaning equipment	—	Cleaner, vacuum, domestic, upright with accessories
C52CD	Cleaning equipment	—	Cleaner, suction, with shampoo
C52CF	Cleaning equipment	—	Cleaner, suction, wet/dry
C52DB	Cleaning equipment	—	Scrubbing/polishing machine, multi-brush
C52EA	Cleaning equipment	—	Trolley bucket, wringer
C59DD	Fire fighting equipment	—	Hose reel, floor mounted with cold water outlet
C56CA	Grille/Shutter/ Hatches	—	Grille, counter, vertical, sliding

Appendix 1

Critical Dimensions

Introduction

1. Critical dimensions are those dimensions which are critical to the efficient functioning of an activity; thus the size of components, their position and the space around them may all be critical to the task being performed. Guidance on these dimensions for a particular activity is provided in the form of *component-user data sheets*. These illustrate components, ie equipment, furniture and fittings, and provide ergonomic data on the space required for users to move, operate or otherwise use the component; information about the component, eg fixing heights, and the users, eg reach, is also provided. Component-user data sheets thus complement the information given on Activity Data 'B' sheets. (see Chapter 6)

2. This appendix contains sheets relevant to this Note. In addition, ergonomic data common to the design of a number of departments is contained in the *Common Activity Spaces* Health Building Note, to which reference should also be made.

Component dimensions

3. These relate to the size and position of components as follows:

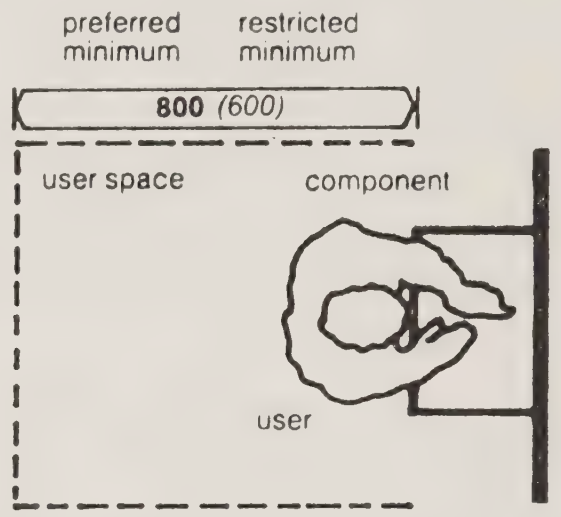
a. Sizes of components are shown thus

b. Preferred component fixing heights are shown as heights above floor level thus

(In some cases an acceptable range of fixing heights is also given in italics.)

Activity dimensions

4. Activity dimensions define the user space, which is the minimum space required to perform an activity. Two types of activity dimension are given:

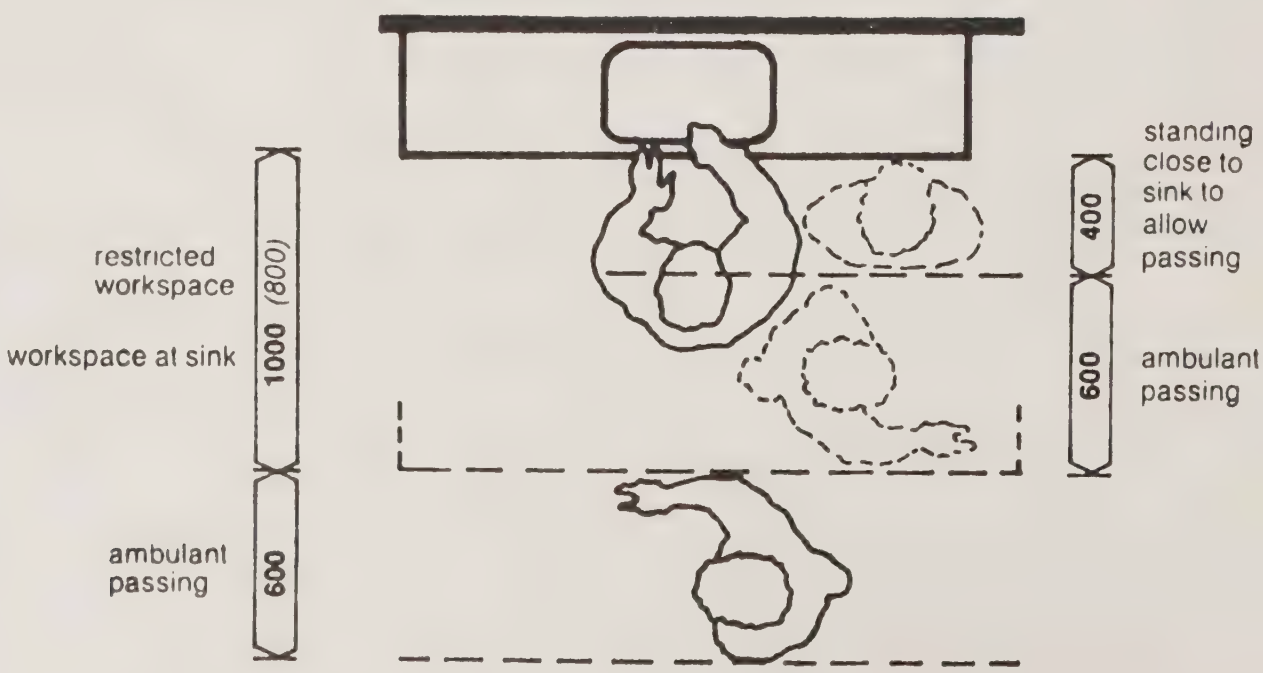


a. Preferred minimum—This defines the minimum space required to carry out an activity efficiently and is shown in bold type.

b. Restricted minimum—This will only allow the activity to be performed at the expense of the user experiencing some difficulty. It is not recommended for general application but may be appropriate when considering the overlapping that can be allowed when two user spaces are adjoining.

Selection of activity dimensions

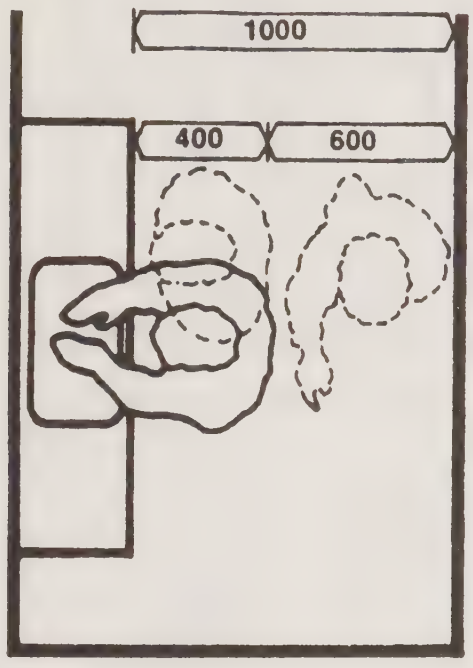
5. When using component-user data sheets to design activity space layouts, selection of the appropriate activity dimensions is essential for economy and efficiency. Selection should be based on careful consideration of the frequency, duration, timing and importance of the activities and also the number of people involved. A typical example of the use of a sink showing activity dimensions provided by the component user data sheet is shown below.



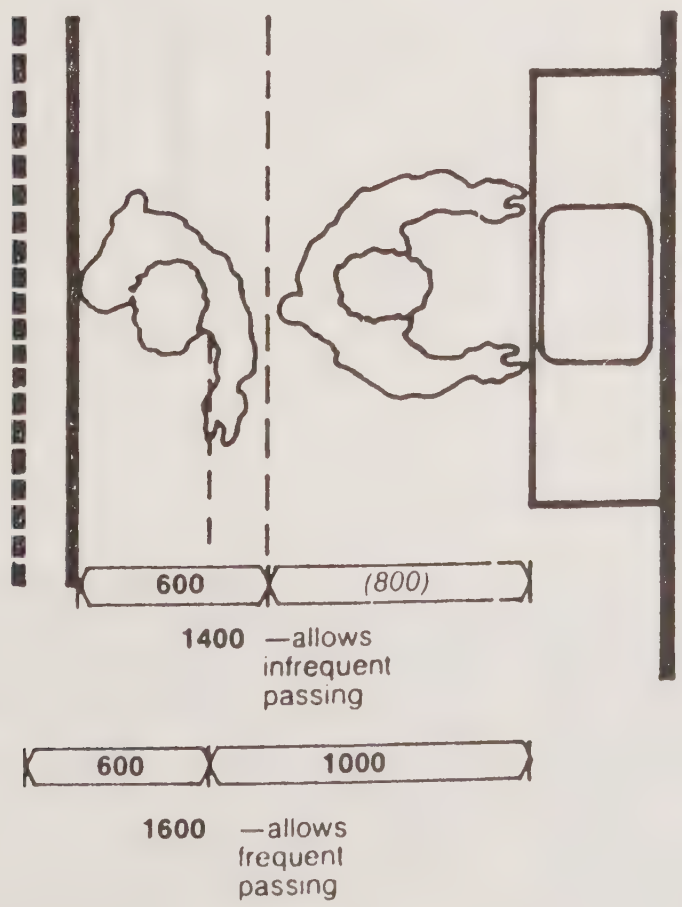
Examples

6. The following worked examples show the sink being used in 3 different situations and show how the appropriate dimensions would be selected. These examples have been simplified and additional factors such as the movement of mobile equipment may also be critical.

a. If the room is normally occupied by one person only the 1000 workspace dimension may be applicable. An (800) restricted dimension should not be used as this dimension is only applicable where two user spaces are adjoining, not where an individual user space is bounded by a wall or solid obstruction. If the person using the sink stops work and stands close to the sink, 1000 is also sufficient space to allow a second person to pass, ie 600 + 400.

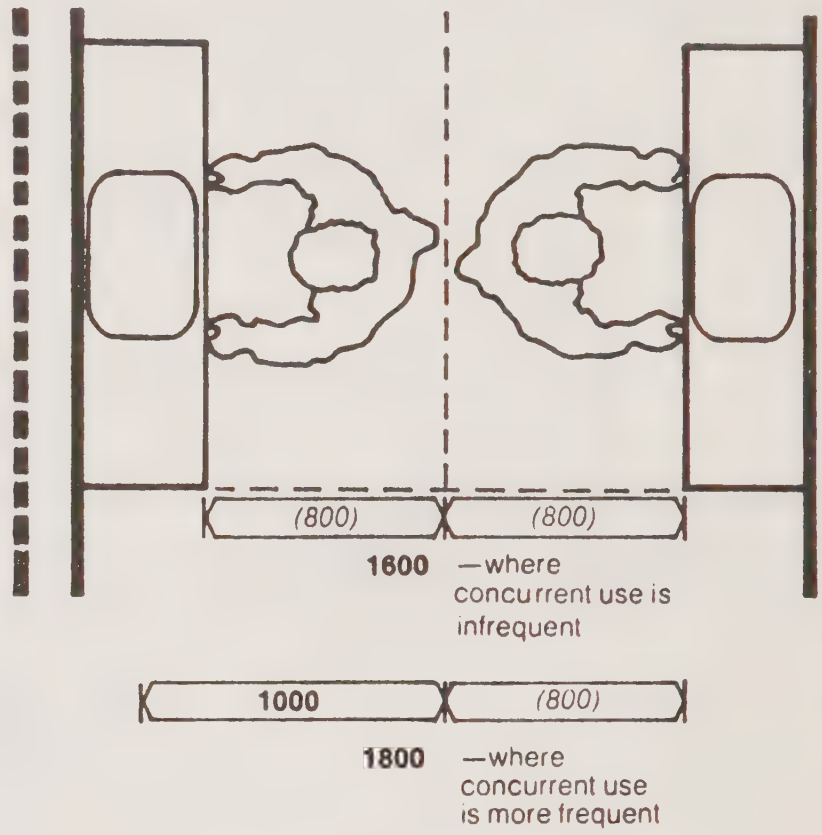


b. If space is required to allow a person to pass, without the user of the sink stopping work, then the 600 passing dimension is added to the workspace dimension. If passing is infrequent then temporary restriction of the sink user's space may be acceptable; this gives an overall dimension of 600 + (800) = 1400. If passing is frequent and restriction of the sink user's space is not acceptable the overall dimension is 600 + 1000 = 1600.



c. Where space has to be provided to enable two sinks to be used concurrently the overall dimension between sinks will be the sum of the workspace dimensions, eg if concurrent use is infrequent and of short duration then (800) + (800) = 1600 may be acceptable. Alternatively 1000 + (800) = 1800 allows the full workspace for one sink user and restricted space for the second user, where concurrent use of the sinks is more frequent.

Note. The passing of a third person between the two sink users may also be critical in this example. Where the sinks are staggered 1400 may be acceptable as in example b.



LIST OF ERGONOMIC DRAWINGS

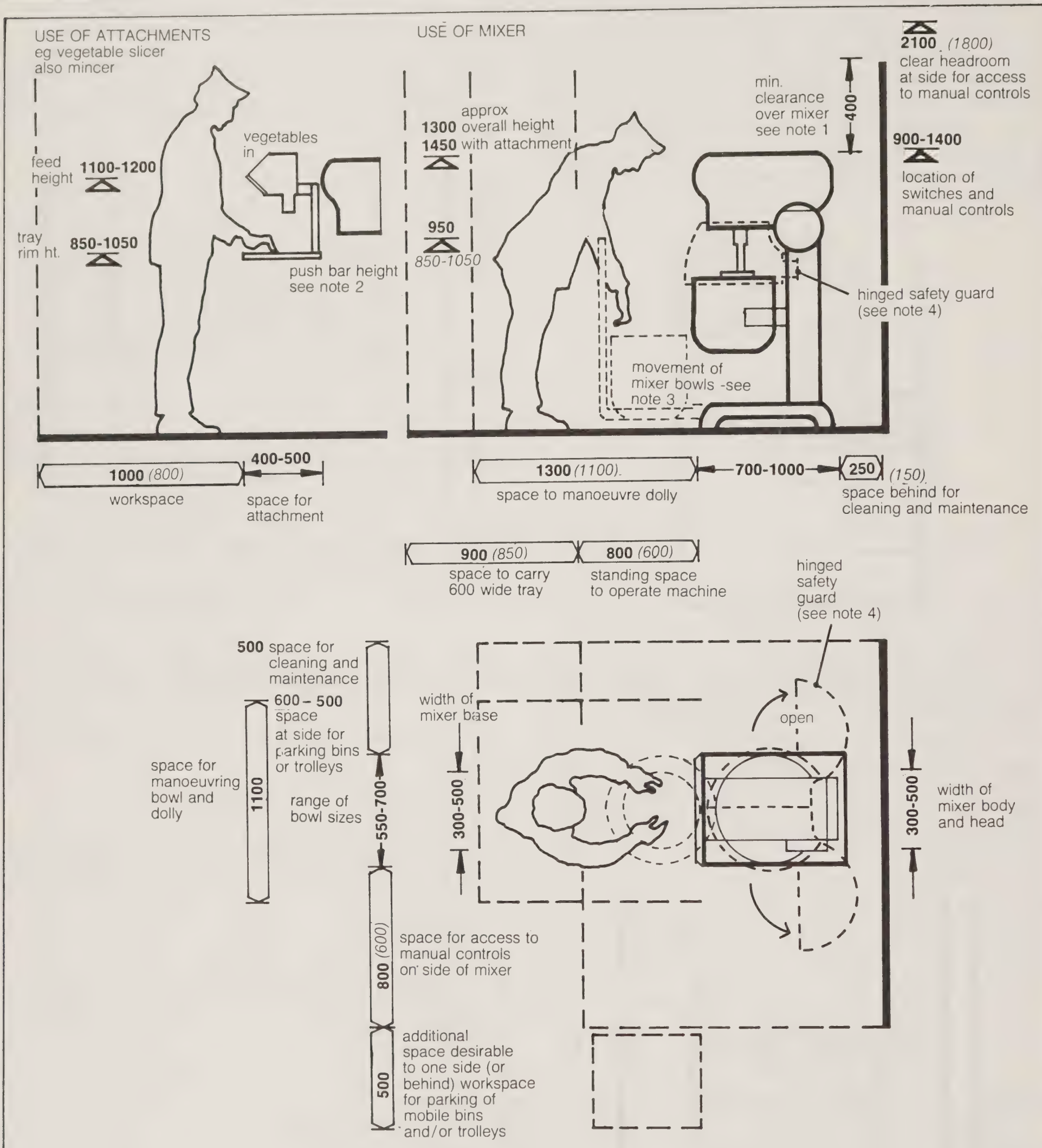
1. Mixer
2. Potato Peeler
3. Range
4. Oven (air convection)
5. Oven (steaming)
6. Bratt Pan
7. Grill (eye level)
8. Fryer (deep fat)
9. Hot Cupboard
10. Boiling Pan
11. Small Boiling Pan
12. Conveyor (1)
13. Conveyor (2)
14. Conveyor (3)
15. Dishwasher (1)
16. Dishwasher (2)
17. Dishwasher (3)
18. Trolley (food service)
19. Service Counter (1)
20. Service Counter (2)
21. Service Counter (3)
22. Table and Chair
23. Table (square)
24. Table (round)
25. Table (rectangular)
26. Banquette Seating (1)
27. Banquette Seating (2)
28. Chair (semi-easy)

Activities:
Mixing of ingredients (by beating, whipping etc)

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Mixer
20/40/50 Quart/180/365/455 litres

Users:
Catering staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. This clearance will be inadequate for top fitting attachments available with some models.

2. It is preferable that dollies should be fitted with push bars to eliminate the need for excessive bending.

3. The lifting and moving of large mixing bowls, especially when loaded, should be mechanically aided.

4. All large mixers must be fitted with guards which do not open until moving parts have stopped.

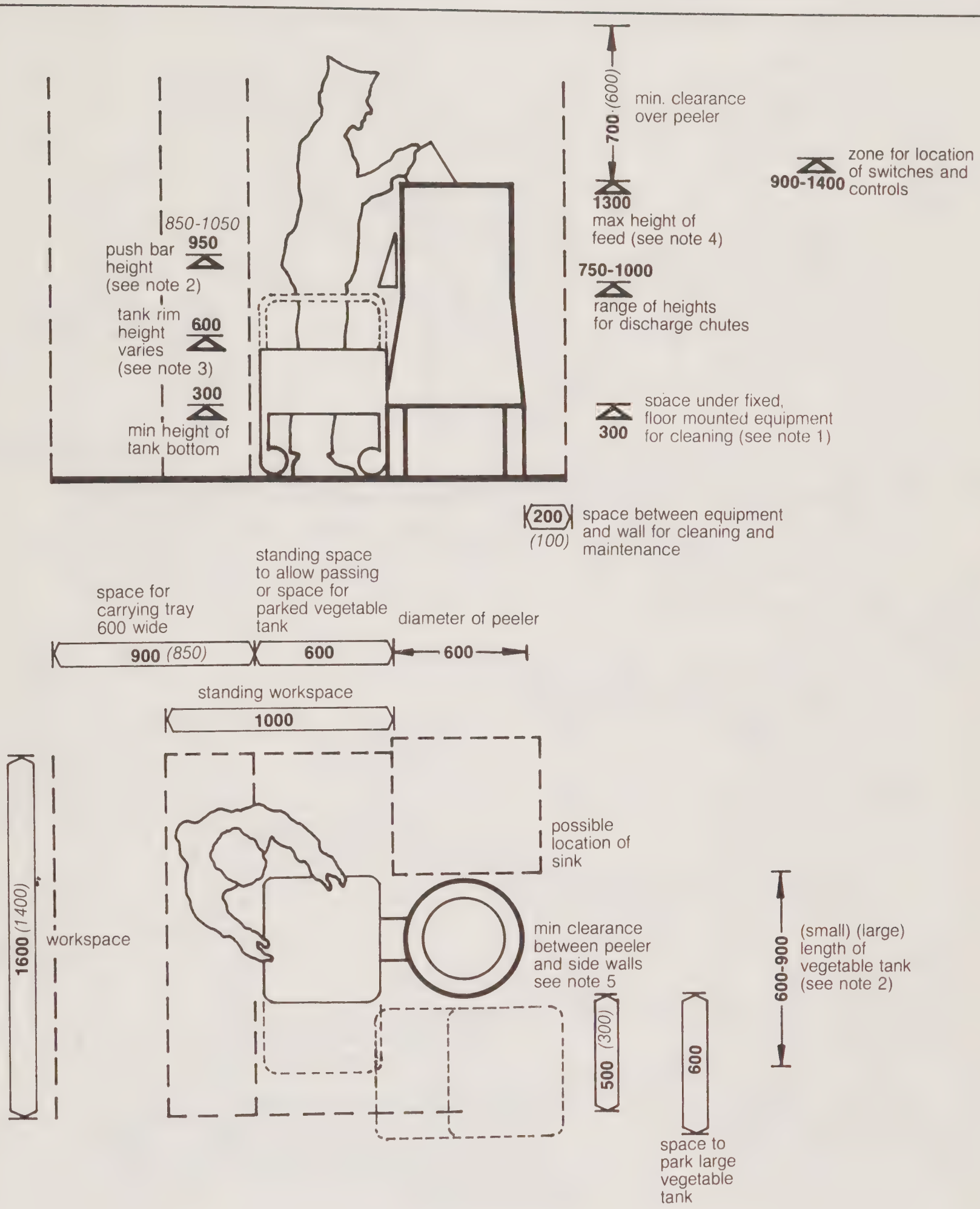
Activities:
Peeling potatoes
Loading and unloading

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Potato peeler

28lb/12.5 kg

Users:
Catering staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Mounting plinth is often required for this equipment. The aim should be to provide a satisfactory compromise between maximum feed height and minimum (or necessary) discharge height.

2. Small vegetable tanks are easier to handle when full especially by female staff and are therefore recommended. Additionally it is important that tanks can be pushed without the need for excessive bending and where necessary a pushbar should be incorporated to facilitate this.

3. Whilst tank rim height must be below discharge chute level, it should be as high as possible and preferably capable of being raised (mechanically or hydraulically) to 950 where tank is used as a sink.

4. The action of feeding the peeler becomes hazardous for small women at about 1350.

5. Apart from for access behind, space will be required for maintenance and cleaning, but this will not exceed the space required for normal use.

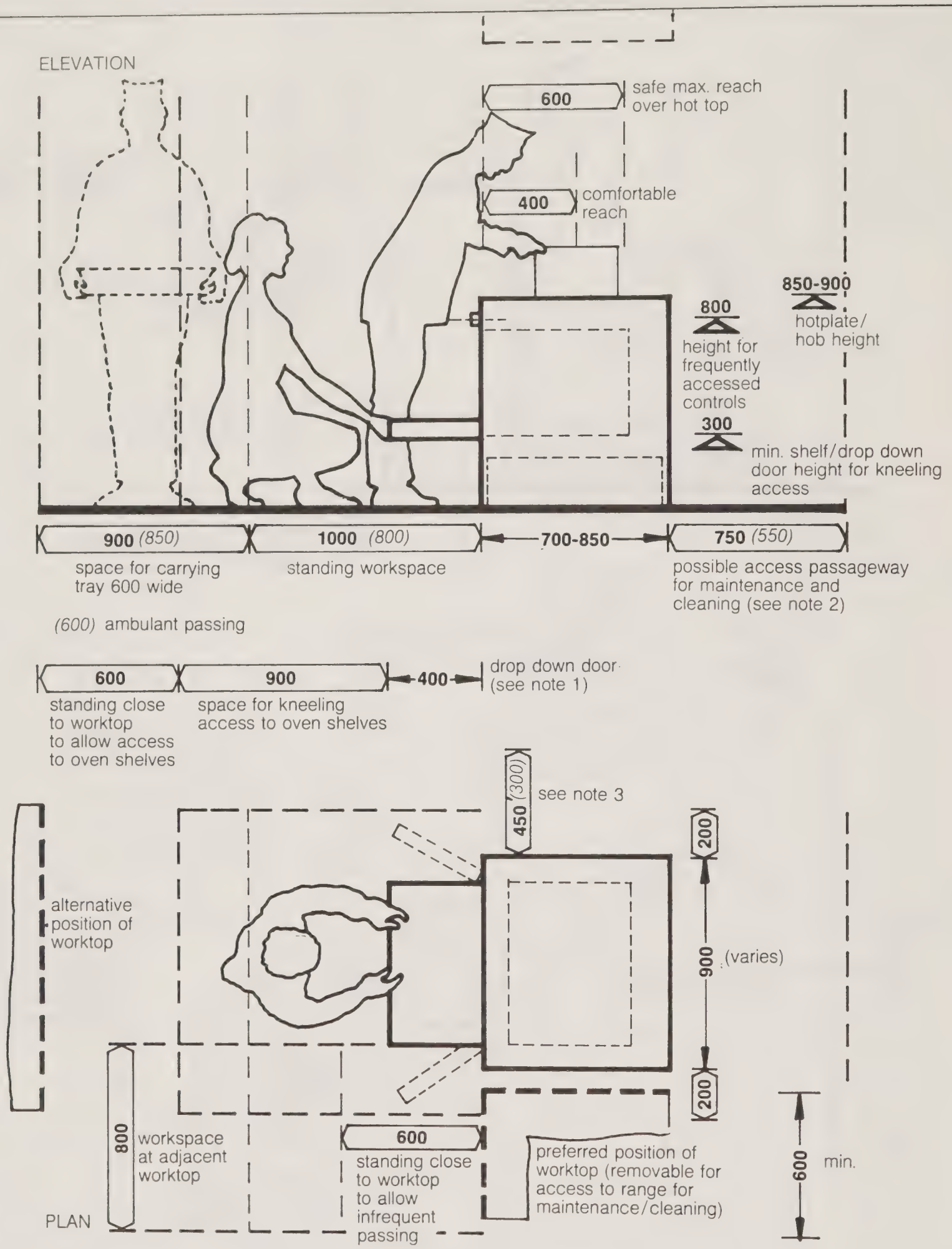
Activities:
General cooking of food.
Maintenance and cleaning of range.

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Range

Heavy duty, gas/electric.

Users:
Catering staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Doors — Drop down doors to ovens are preferred to side hinged doors as they allow hot trays etc. to be rested on them for inspection of food, or prior to lifting in and out of oven. (Max. preferred projection of drop down doors - 400).

2. Access to back of range — Where heavily serviced equipment is arranged "back to back" an access passageway for maintenance and cleaning is preferred. Easily removable equipment (e.g. worktops) located adjacent to and/or on the opposite side of the access passageway can improve access for cleaning and maintenance. The restricted width of (550) shown may be hazardous and uncomfortable when the range is hot. The preferred workspace for working at the back of the equipment using large tools in a bent or kneeling posture is 1100 - (restricted workspace 900). The use of hand operated forklifts may also need to be considered for moving the range into, or out of position.

3. Access to side of range — 450 dimension is preferred for cleaning and maintenance, restricted space of (300) can be hazardous when range is hot. Where adjacent equipment is more than 900 high these dimensions should be increased to 500 (350).

4. It is not recommended that shelves or racks be positioned over deep ranges because of the potential danger of reaching over hot range tops.

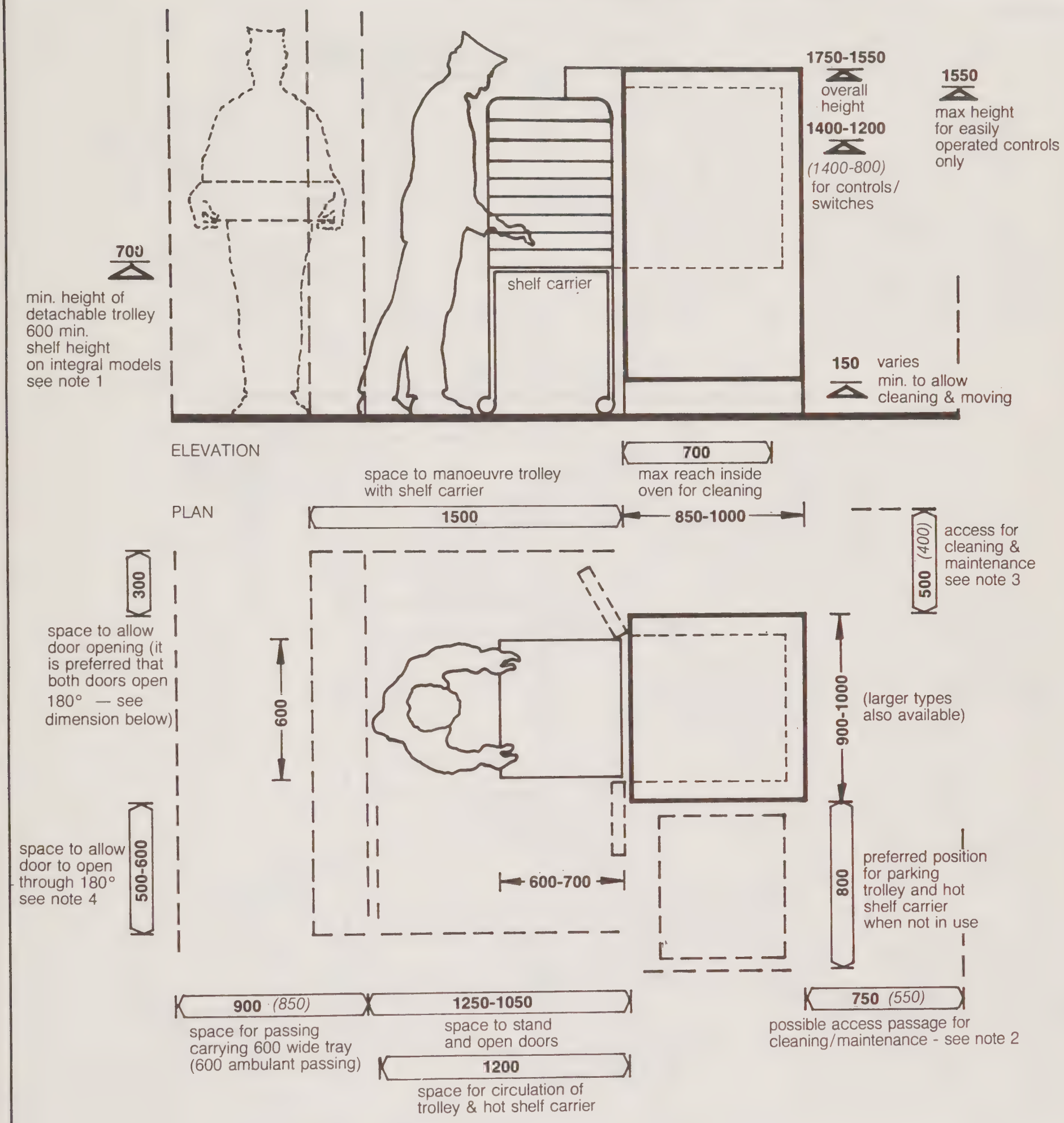
Activities
Cooking prepared foods. Loading and unloading trays using special trolley and carrier.

DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

Oven

Air convection (double doors)
single door — see note 4.

Users
Catering staff.



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. The need to adopt a bent posture when moving the hot shelf carrier should be avoided - this applies particularly to those models where the upper shelf section is detachable from the trolley base - where shelf section and trolley are integral a lower bottom shelf position can be safely incorporated.

2. Access to back of oven - where heavily serviced equipment is arranged "back to back" an access passageway for maintenance and cleaning is preferred. Easily removable equipment (e.g. worktops) located adjacent to and/or on the opposite side of the access passageway can improve access for cleaning and maintenance. The restricted width of (550) shown may be hazardous and uncomfortable when the oven is hot. The preferred workspace for working at the back of the equipment using large tools in a bent or kneeling position is 1100 — (restricted workspace 900). The use of hand operated forklifts may also need to be considered for moving the equipment into or out of position.

3. Access to side of oven for maintenance and cleaning — restricted access (400) can be hazardous and uncomfortable when equipment is hot.

4. Single side hung door - space at side to allow 180° opening — 1200 (1100 wide oven) 1000 (900 wide oven) — space at side to allow 120° opening — 800 (1100 wide oven) 650 (900 wide oven). (It is preferred that single side hung door should be opened to 180° to give unobstructed access).

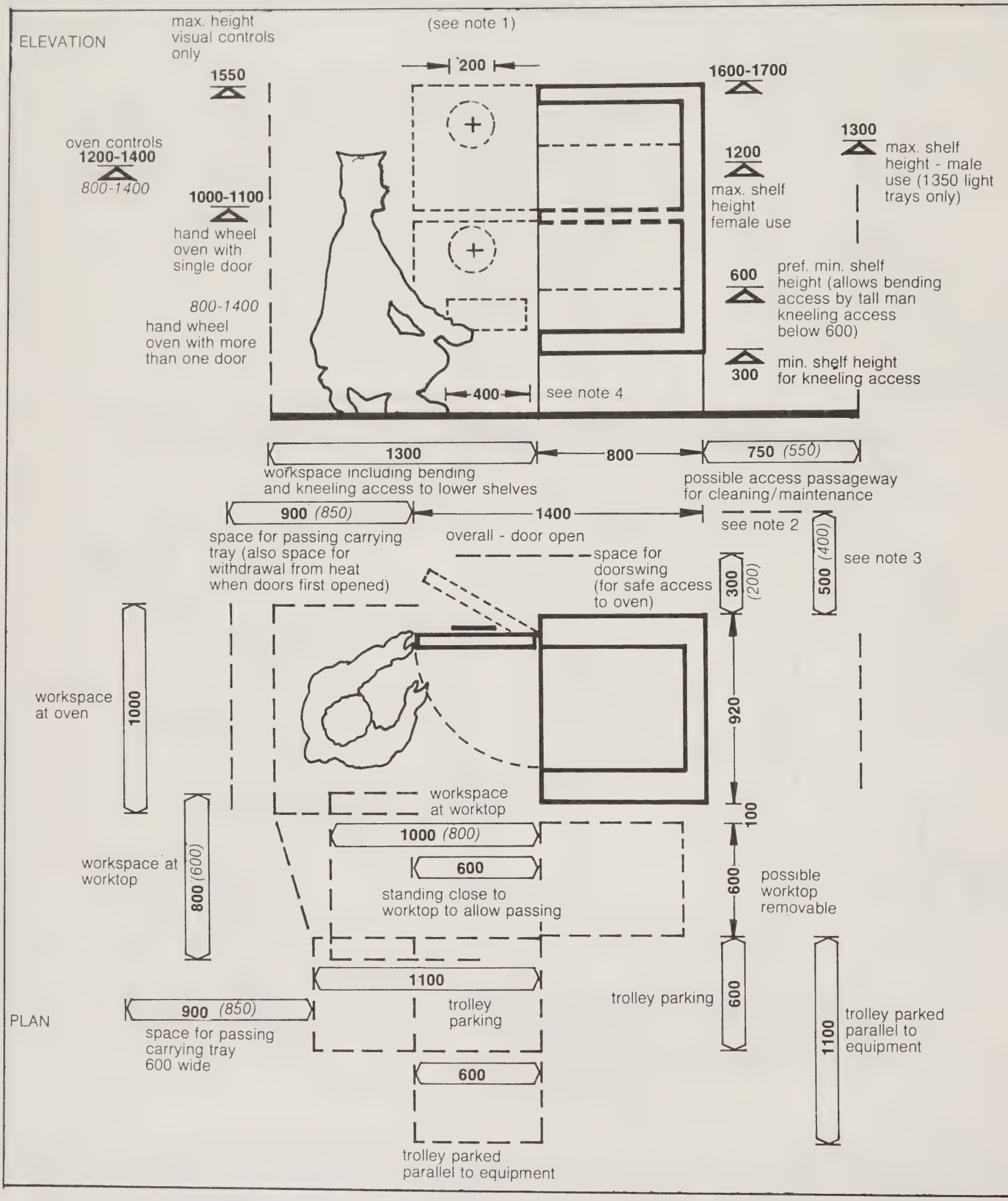
Activities:
Cooking of food by steaming

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Oven

Steaming - 2 compartments

Users:
Catering staff



1350 *(1300)*
Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. 200 min. handwheel diameter; rim thickness 20 min; operating force 13kg max.
2. Access to back of oven -
Where heavily serviced equipment is arranged "back to back" an access passageway for maintenance and cleaning is preferred. Easily removable equipment (e.g. worktops) located adjacent to and/or on the opposite side of the access passageway can improve access for cleaning and maintenance. The restricted width of 550 shown may be hazardous and uncomfortable when the equipment is hot. The preferred workspace for working at the back of the equipment using large tools is 1100 (restricted workspace 900). The use of hand operated forklifts may also need to be considered for moving the equipment into or out of position.
3. Access to side of oven - restricted access (400) can be hazardous and uncomfortable when equipment is hot.
4. All shelves should incorporate pull out facility with safety stop.

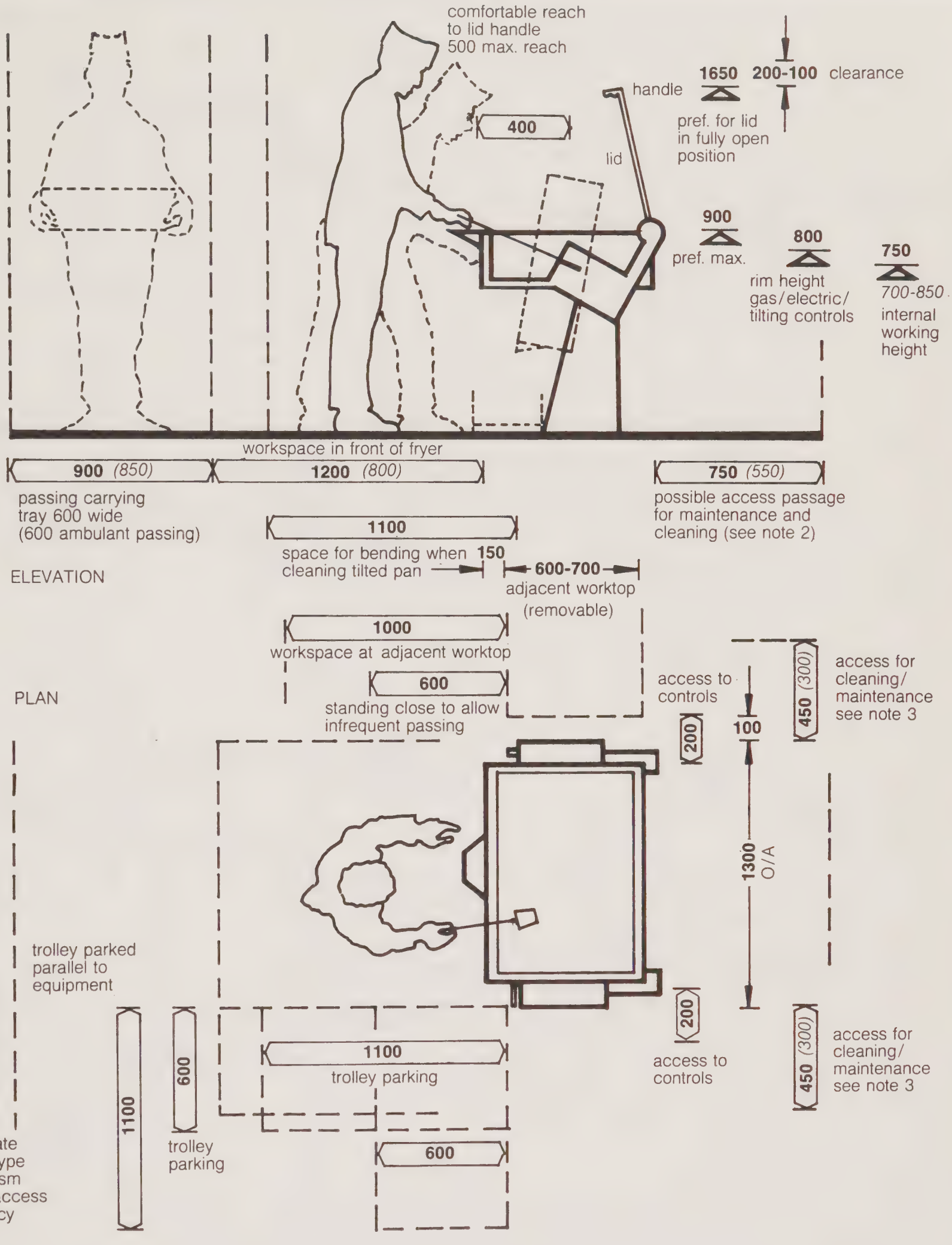
Activities
Shallow frying of food maintenance and cleaning of bratt pan.

DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

Bratt pan

Tilting

Users
Catering staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Radiant heat produced by the equipment makes it necessary that space be available to move away from the immediate proximity of the equipment when cooking activity allows it.

2. Access to back of equipment - where heavily serviced equipment is arranged "back to back" an access passageway for maintenance and cleaning is preferred. Easily removable equipment (e.g. worktops) located to and/or on the opposite side of the access passageway can improve access for catering and maintenance. The restricted width of (550) shown may be hazardous and uncomfortable when the equipment is hot. The preferred workspace for working in a bent or kneeling position is 1100 (restricted work-space 900).

3. Access to side of equipment - 450 dimension is preferred for cleaning and maintenance. Restricted space of (300) car be hazardous if the equipment is hot. Where adjacent equipment is more than 900 high these dimensions should be increased to 500. (350).

4. Tilting mechanism - optimum crank handle diameter 140-180 with low frictional resistance (up to 0.9kg).

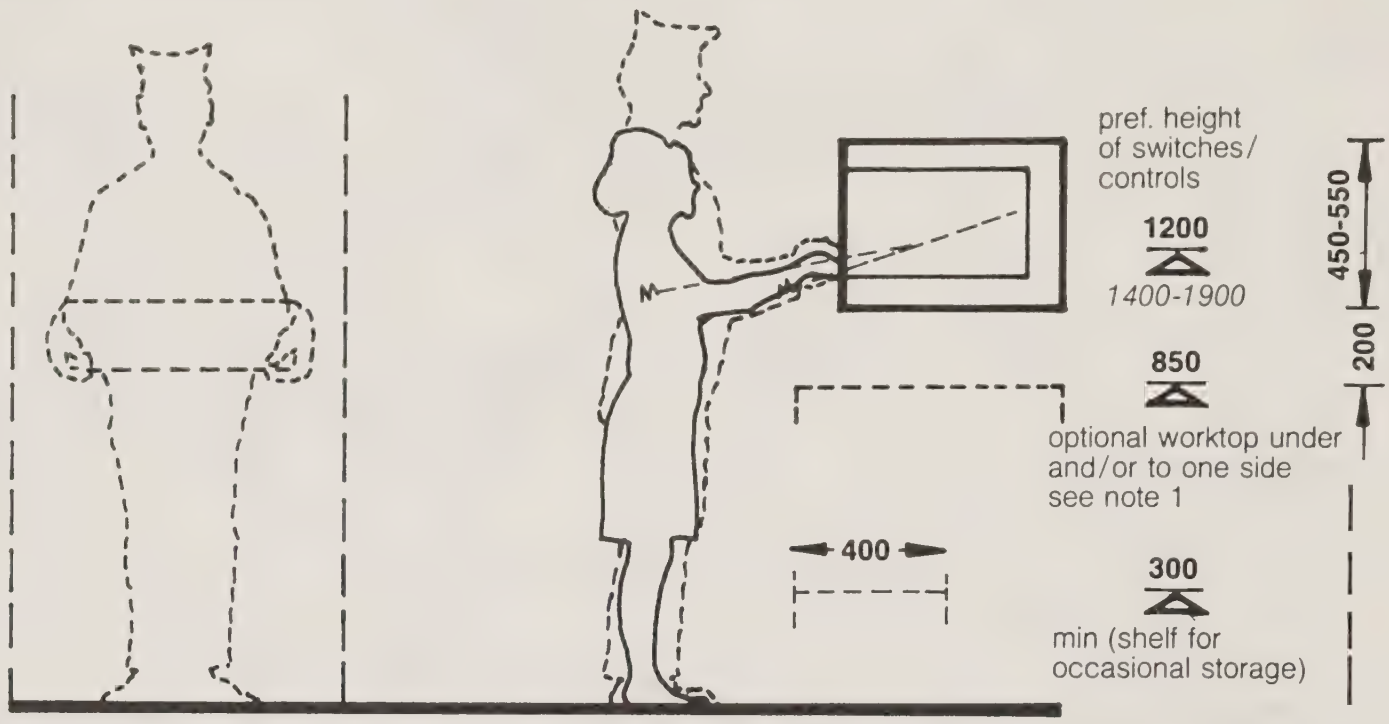
Activities
Grilling food

DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

Grill

Eye level

Users
Catering staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. It is not recommended that a range or other facility frequently accessed during cooking activities, be located under the grill as this is potentially dangerous.

2. Access to back of grill —
Where heavily serviced equipment is arranged "back to back" an access passageway for maintenance and cleaning is preferred. Easily removable equipment (e.g. worktops) located adjacent to and/or on the opposite side of the access passageway can improve access for cleaning and maintenance. The restricted width of 550 shown may be hazardous and uncomfortable when the equipment is hot. The preferred workspace for working at the back of the equipment using large tools is 1100 (restricted workspace 900). The use of hand operated forklifts may also need to be considered for moving the equipment into, or out of position.

3. Access to side of grill —
Restricted access (400) can be dangerous and uncomfortable when equipment is hot.

4. Workspace depth takes account of the need to withdraw from the immediate proximity of the radiant heat produced whenever the cooking activity allows it.

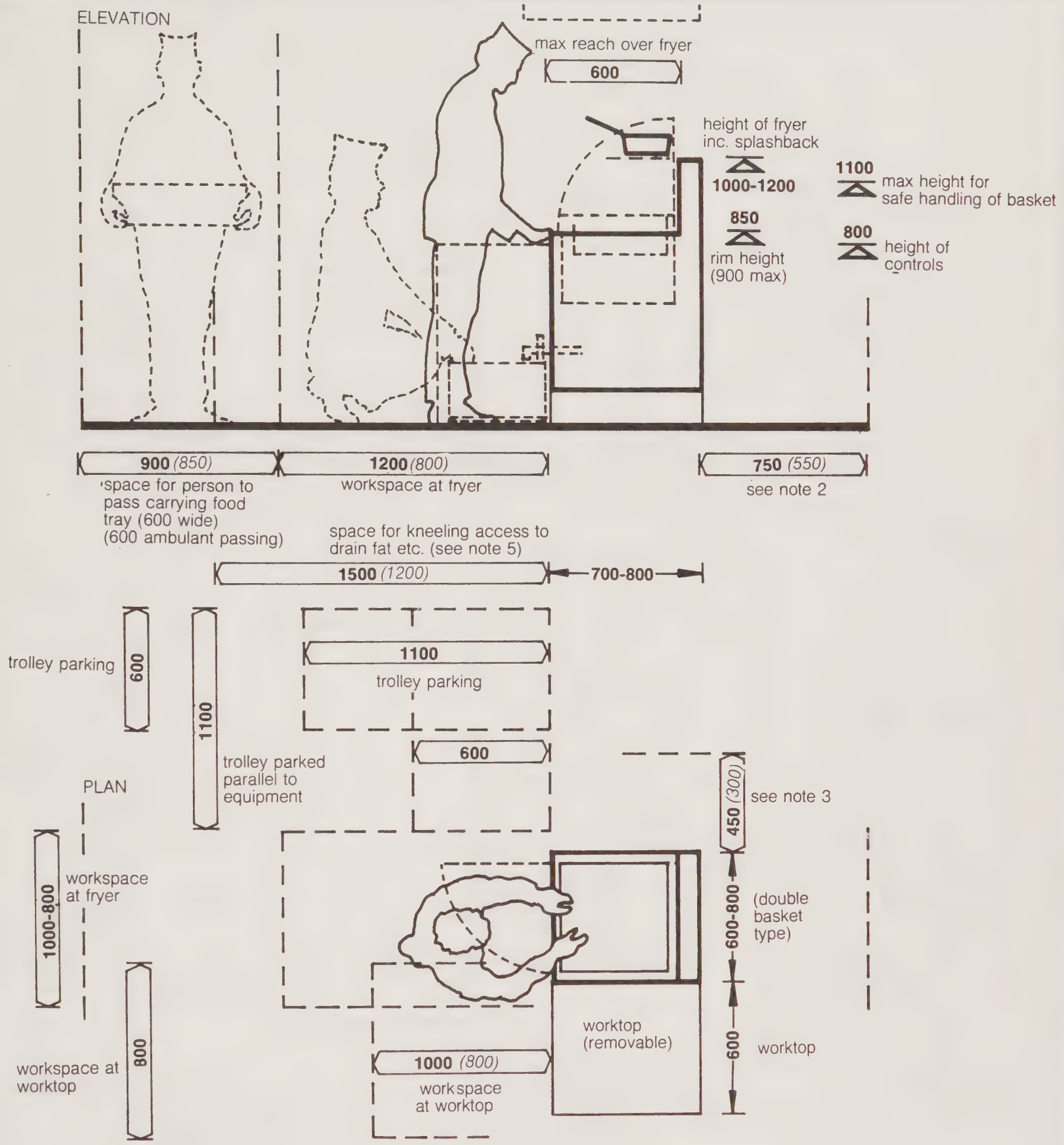
Activities:
Deep fat frying of food - draining and cleaning

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Fryer

Deep fat

Users:
Catering staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. The positioning of a rack/shelf over the fryer is not recommended as this is potentially dangerous.

2. Access to back of fryer —
Where heavily serviced equipment is arranged "back to back" an access passageway for maintenance and cleaning is preferred. Easily removable equipment (e.g. worktops) located adjacent to and/or on the opposite side of the access passageway can improve access for cleaning and maintenance. The restricted width of 550 shown may be hazardous and uncomfortable when the equipment is hot. The preferred workspace for working at the back of the equipment using large tools is 1100 (restricted workspace 900). The use of hand operated forklifts may also need to be considered for moving the equipment into, or out of position.
Where there is no passageway behind the fryer, both fryer and worktop should be movable for cleaning.

3. Access to side of fryer - 450 dimension is preferred for cleaning and maintenance. Restricted space of (300) can be hazardous when equipment is hot. Where adjacent equipment is more than 900 high, these dimensions should be increased to 500 (350).

4. A worktop adjacent to each fryer is preferred for transferring cooked food onto trays. A trolley is usually used to transport uncooked food to fryer e.g. large bags of chips etc.

5. Fat is drained off daily by opening access door and placing bucket (or similar) under nozzle.

6. Lids are required for use in case of fire.

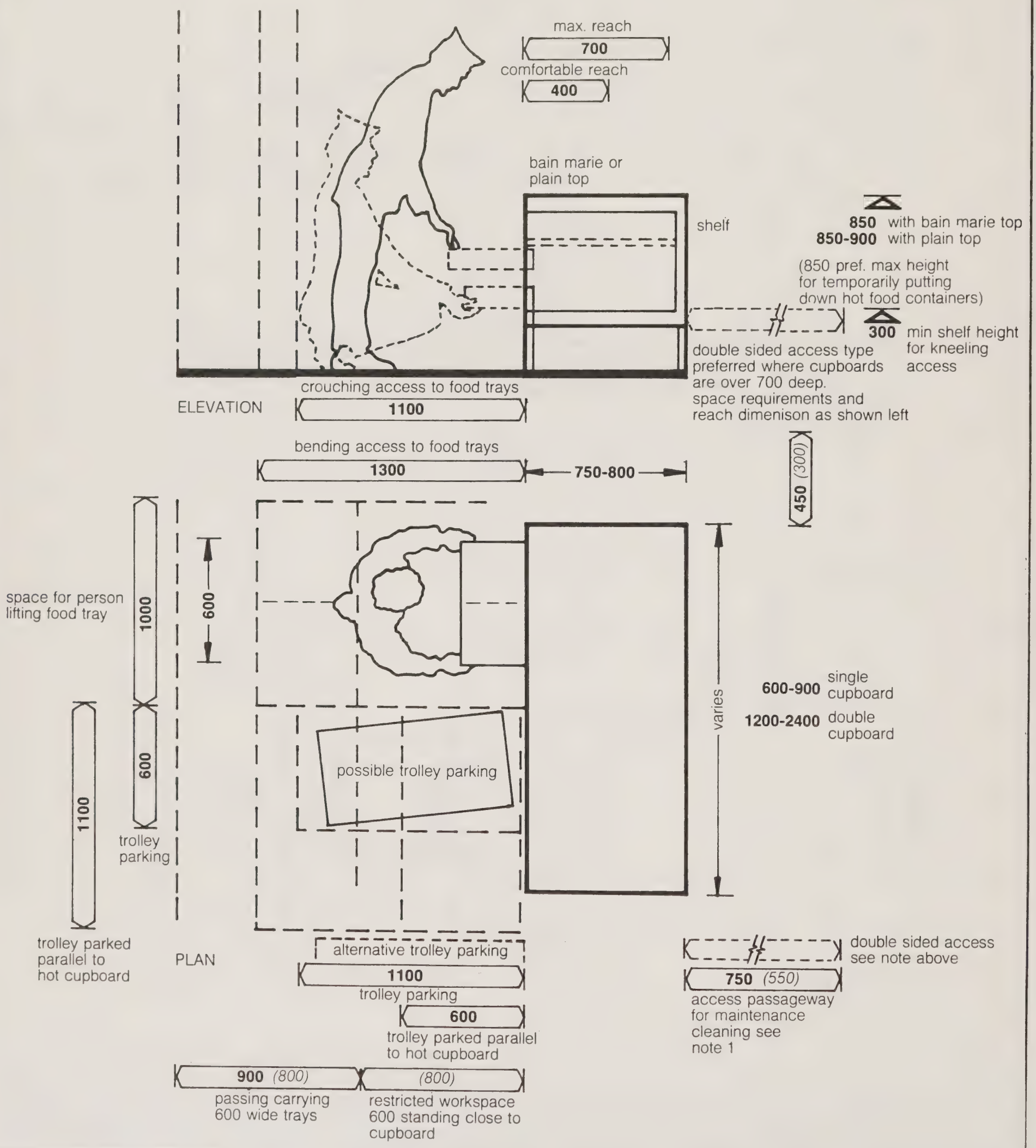
Activities
Storage of cooked food in containers

DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

Hot cupboard

Kitchen. Plain top/bain marie top sliding doors.

Users
Catering staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Access to back of hot cupboard - where heavily serviced equipment is arranged "back to back" an access passageway for maintenance and cleaning is preferred. Easily removable equipment (e.g. worktops) located adjacent to and/or on the opposite side of the access passageway can improve access for cleaning and maintenance. The restricted width of (550) shown may be hazardous and uncomfortable when the cupboard is hot. The preferred workspace for working at the back of the equipment using large tools in a bent or kneeling position is 1100 (restricted workspace 800). The use of hand operated forklifts may also need to be considered for moving the equipment into, or out of position.

Activities:
Boiling food

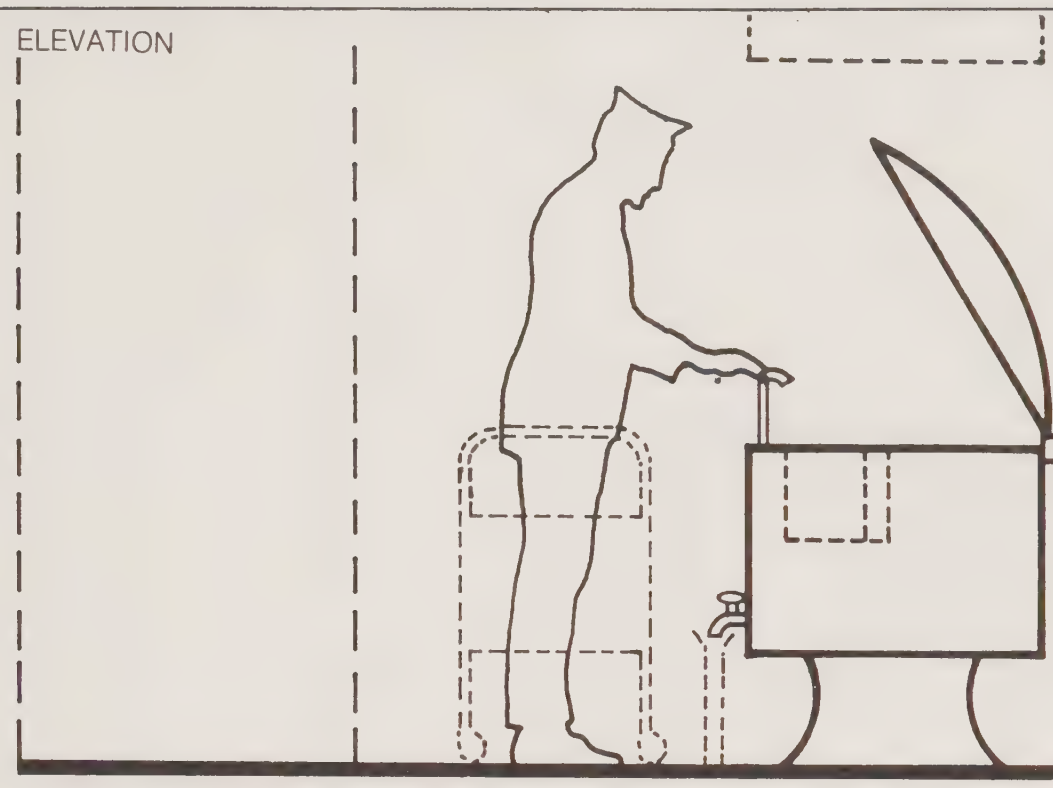
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Boiling pan

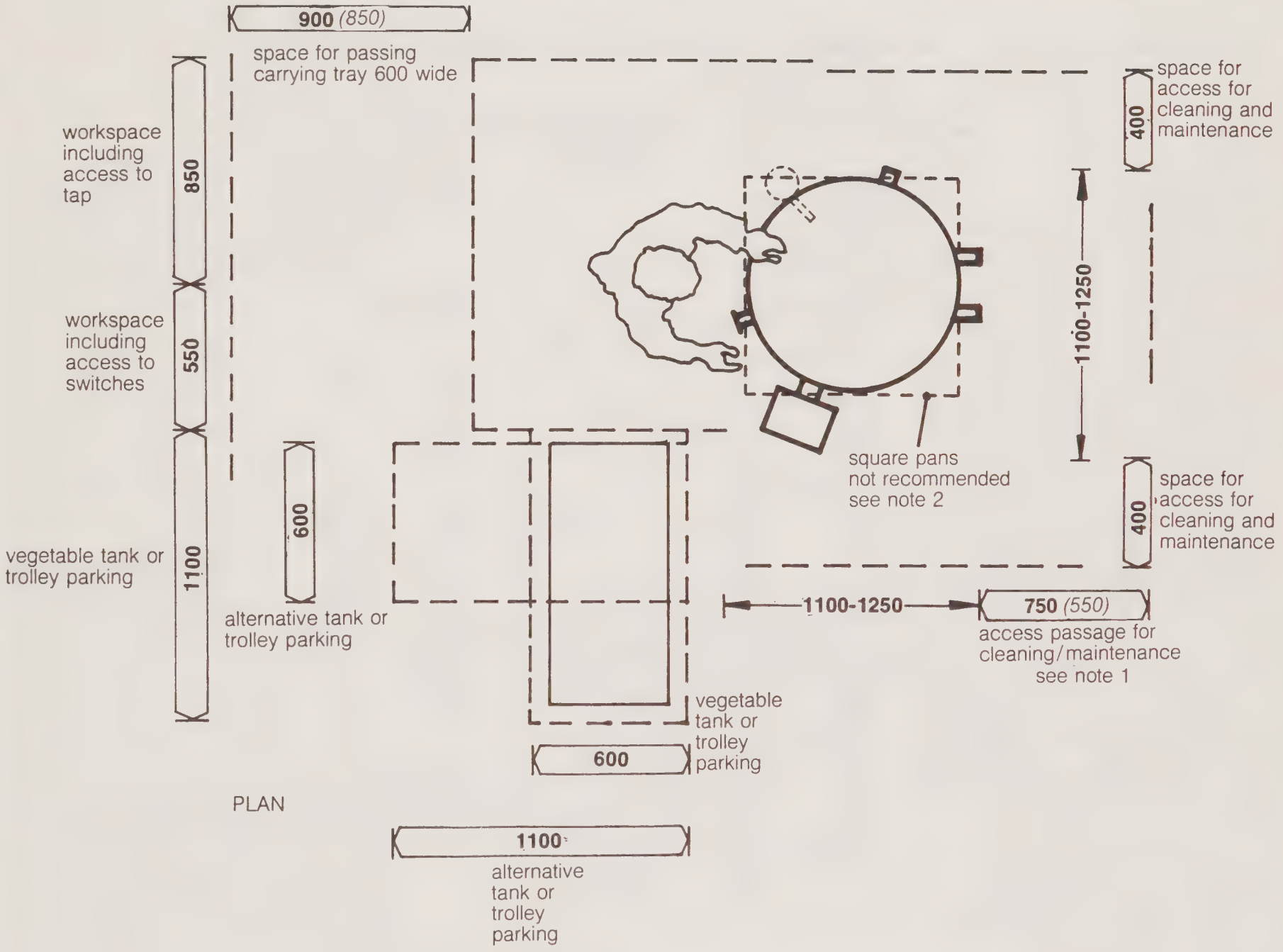
20 - 30 gallon/90 - 135 litres

Users:
Catering staff

ELEVATION


2000
1100 tap switches and controls
1200-1400
850 pref. max rim height
600 min height for low level controls and switches for bending
400 access
min height for taps/switches for kneeling access

PLAN



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Access to back of boiling pan - Where heavily serviced equipment is arranged "back to back" an access passageway for maintenance and cleaning is preferred. Easily removable equipment (e.g. worktops) located adjacent to and/or on the opposite side of the access passageway can improve access for cleaning and maintenance. The restricted width of 550 shown may be hazardous and uncomfortable when the equipment is hot. The preferred workspace for working at the back of the equipment using large tools is 1100 (restricted workspace 900).

2. Square pans are not recommended. Operational experience has identified unacceptable difficulties in stirring soups and other liquid preparations. Emptying and cleaning is also more difficult where the pan is not installed in a slightly tilted position.

Activities:
Boiling food e.g. vegetables, meat etc.

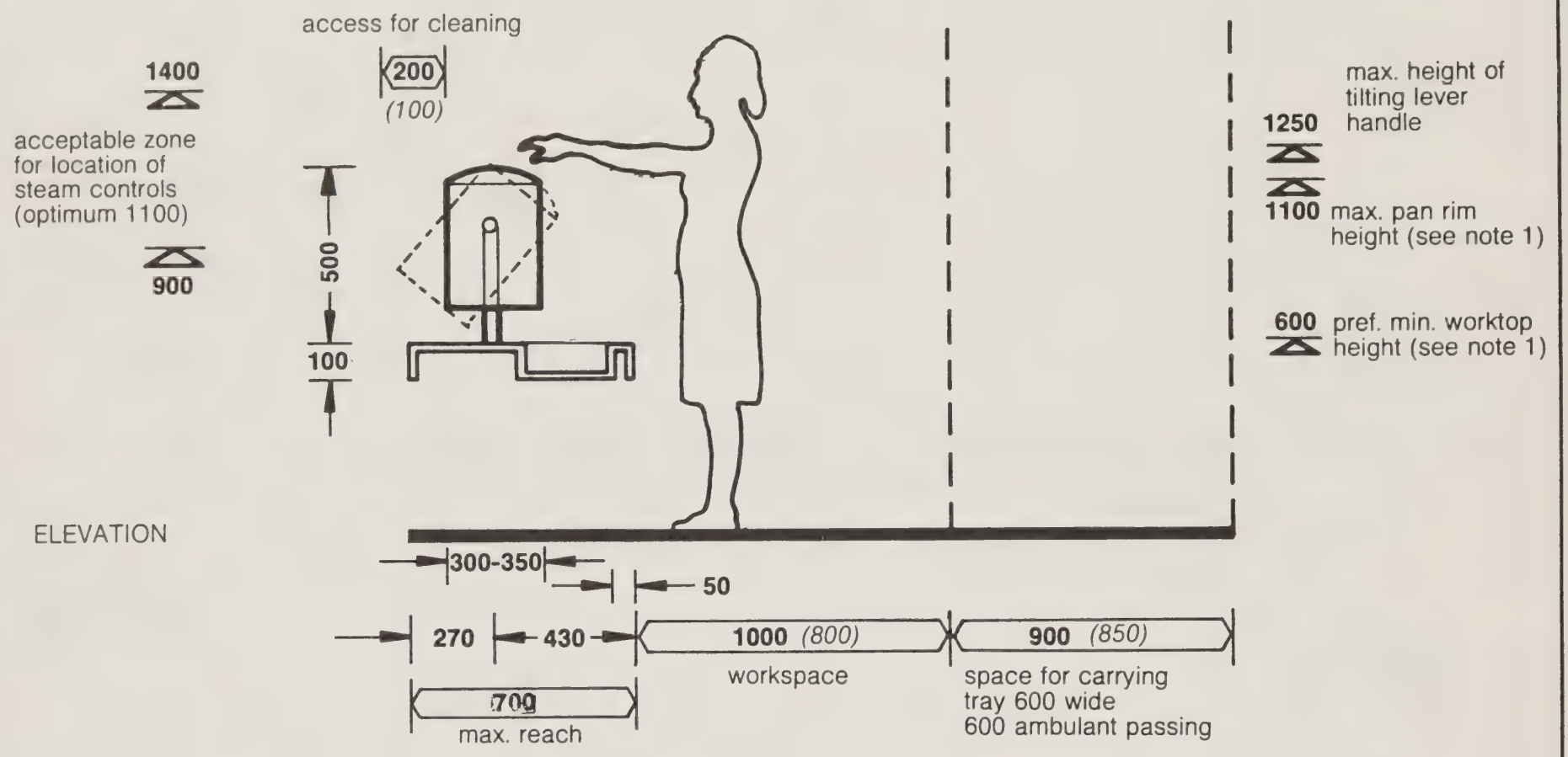
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Small boiling pan

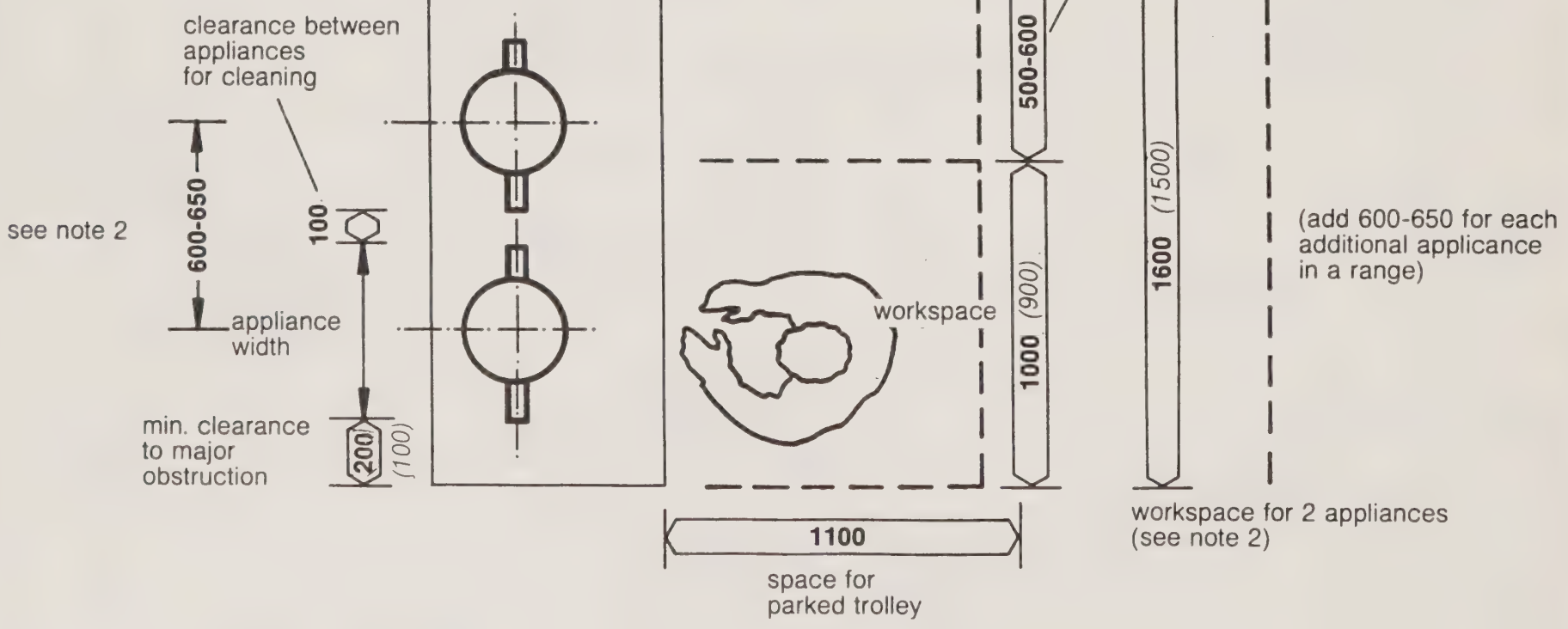
Tilting
Table mounted
5-10 galls/22-45 litres

Users:
Catering staff

ELEVATION



PLAN



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use; see explanatory notes)*

Notes:

1. Lower rim heights (approx. 1000) are preferred, but this reduces the height of the worktop below 600, which required an unsatisfactorily low bending posture for cleaning top and increasingly difficult access for cleaning and maintenance under worktop.

2. It is assumed that concurrent access to adjacent pans will not be required. (Add 50 to dimensions where larger appliances are used).

Activities:
Preparing trays, including loading with menu cards, cutlery, heated bases and plates. (see also Conveyor (2) & (3) data sheets)

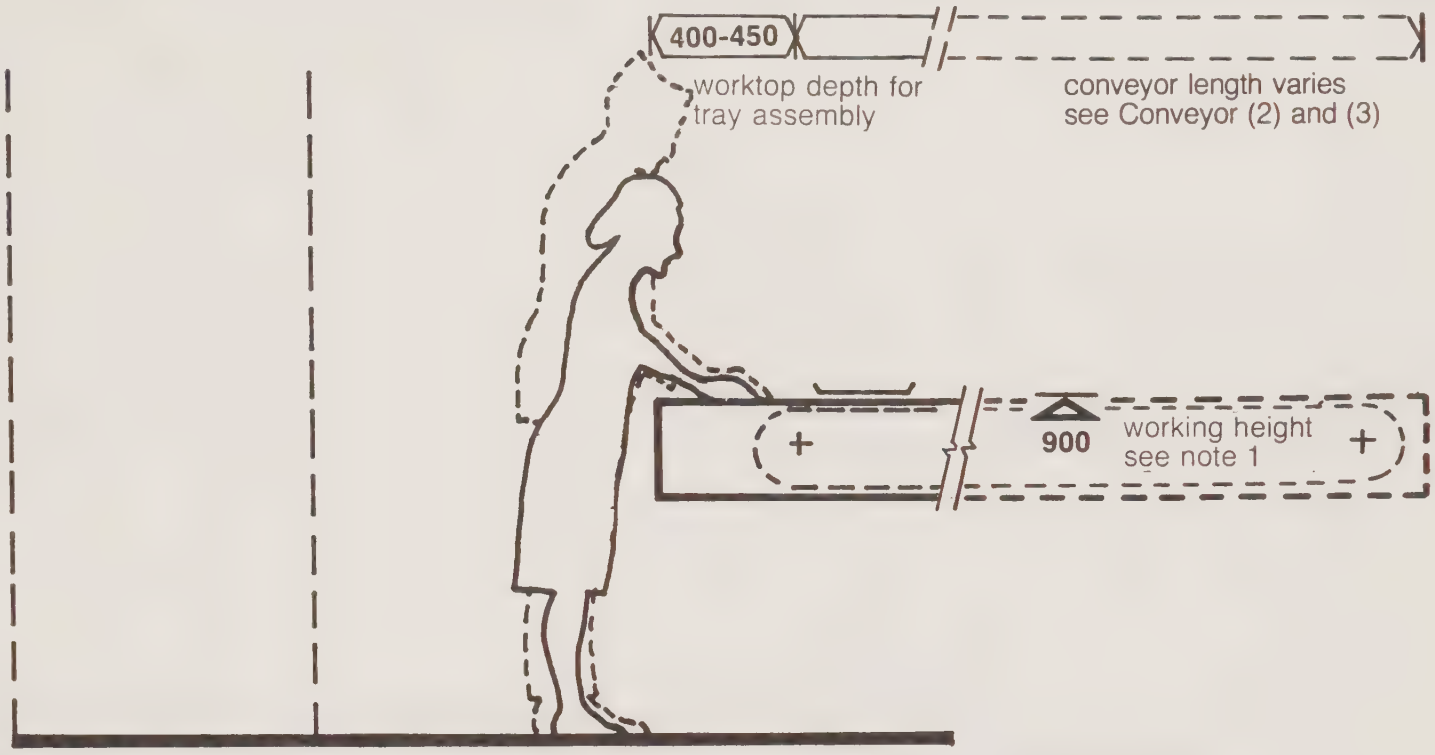
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Conveyor (1)

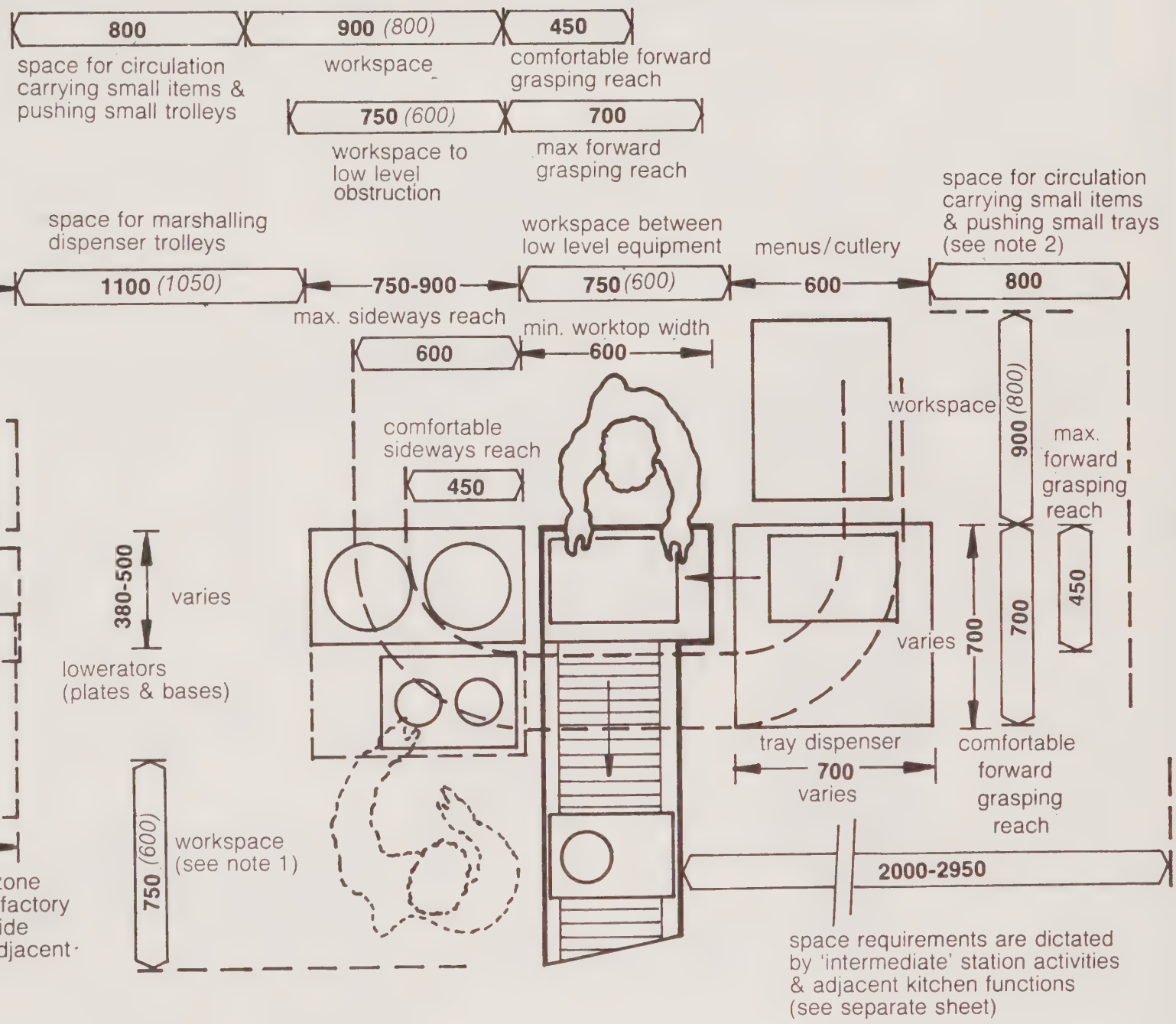
Trayed meals

Users:
Catering staff

ELEVATION



PLAN



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Where deep dispensers are used, reach exceeds safe capability of first station operator, a second operator must be introduced.

2. Circulation space must be increased for other traffic conditions.

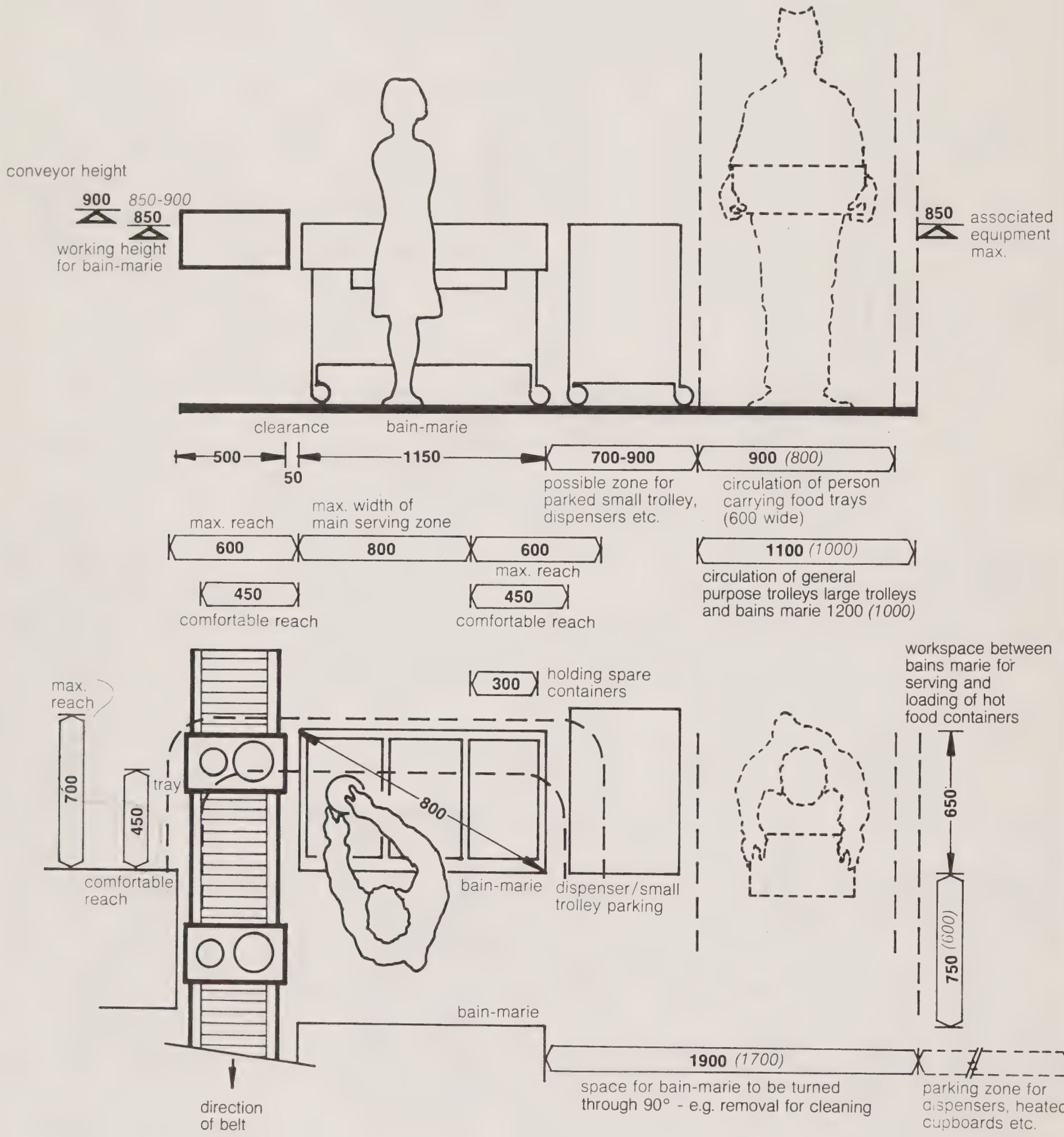
Activities:
Serving food from bain-marie

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Conveyor (2)

Trayed meals

Users:
Catering staff



1350 (1300)

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

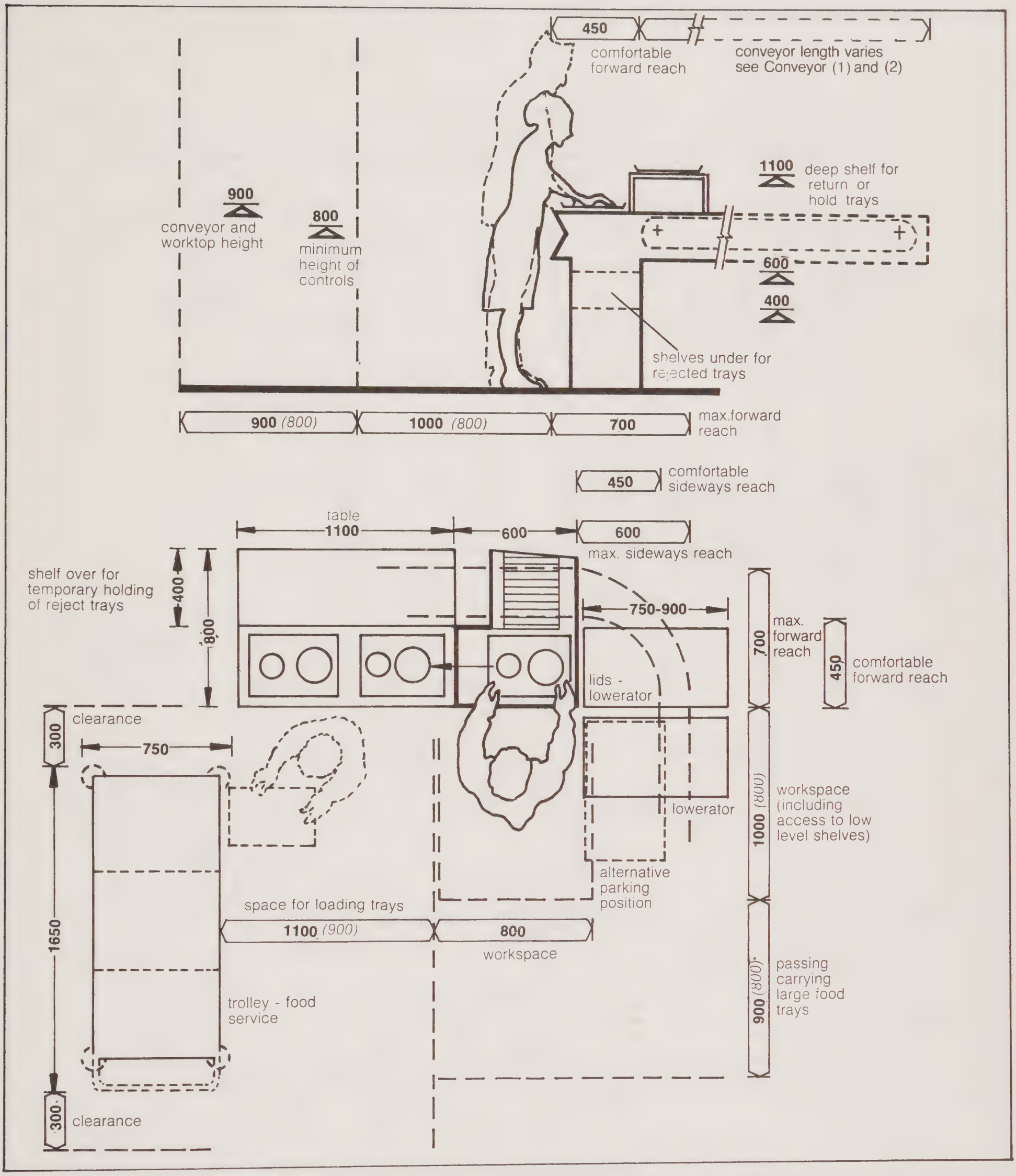
Activities:
Checking trayed meals, placing lids on plates, loading trays into trolleys

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Conveyor (3)

Trayed meals

Users:
Catering staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

worktop level dispenser type equipment only. Where conventional trolleys are used additional space for bending and kneeling access to lower shelves must be provided.

Notes:

1. Activity dimensions given relate to

Activities:

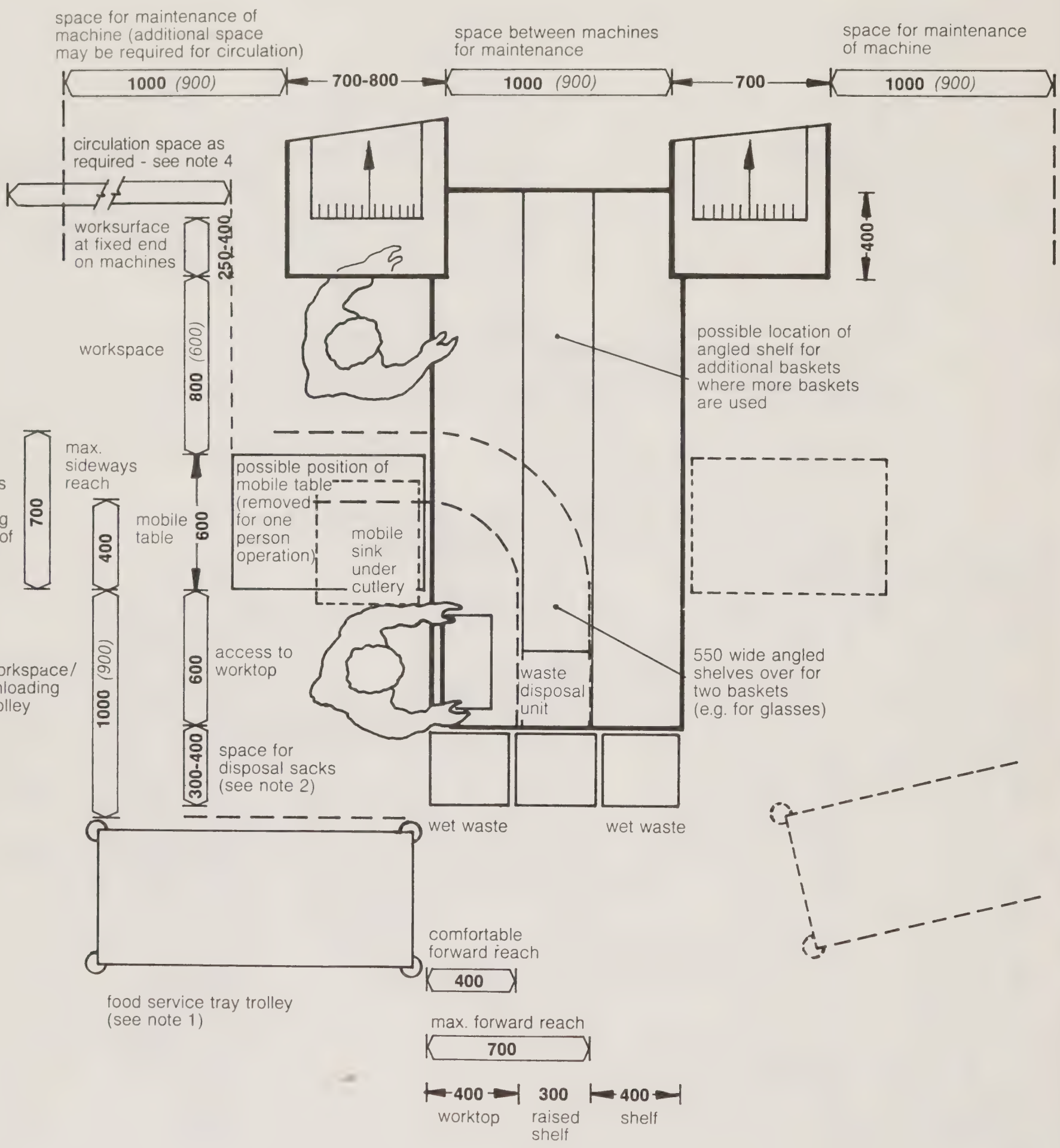
Stripping trays, sorting and loading machine (operation of two machines) with two persons per machine) See also Dishwasher (2) & (3) data sheets

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Dishwasher (1)

Automatic - Flight type

Users:
Catering staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Other types of trolley may also be unloaded e.g. self-clearing tray trolleys from dining room, staff clearing trolleys. Alternatively a mechanical system may be adopted for returns from the dining room.

2. Disposal sacks should be open topped in this working situation.

3. Arrangement shown is intended as an example only - individual projects will have generated specific requirements for staffing levels, numbers of meals, method of clearing staff dining room etc. which affect arrangements required.

4. Recommended space for trolley circulation and replacement 1100 (1000).

Activities:

Stripping trays and sorting
Sections (see also plan - Dishwasher (1)

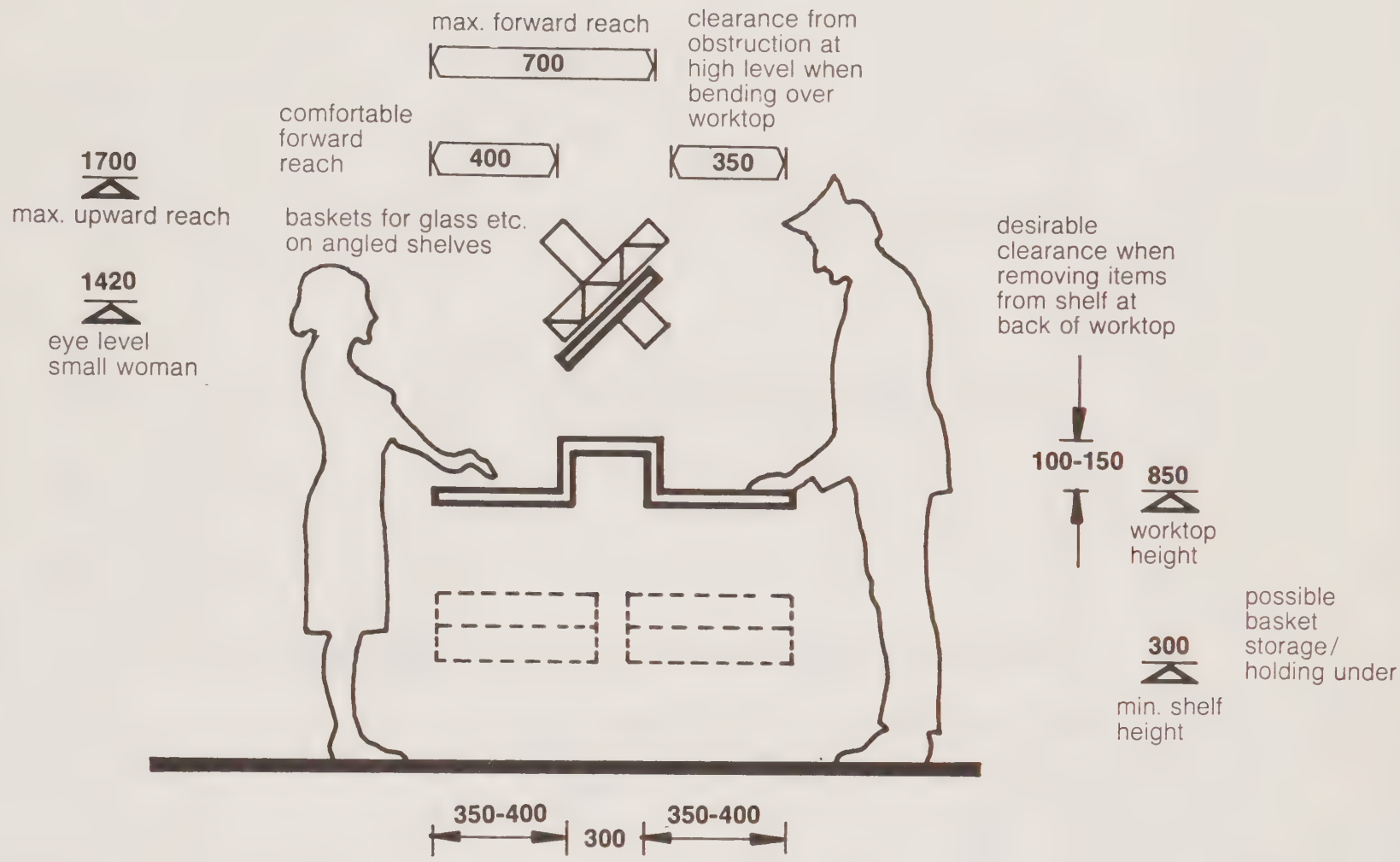
DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Dishwasher (2)

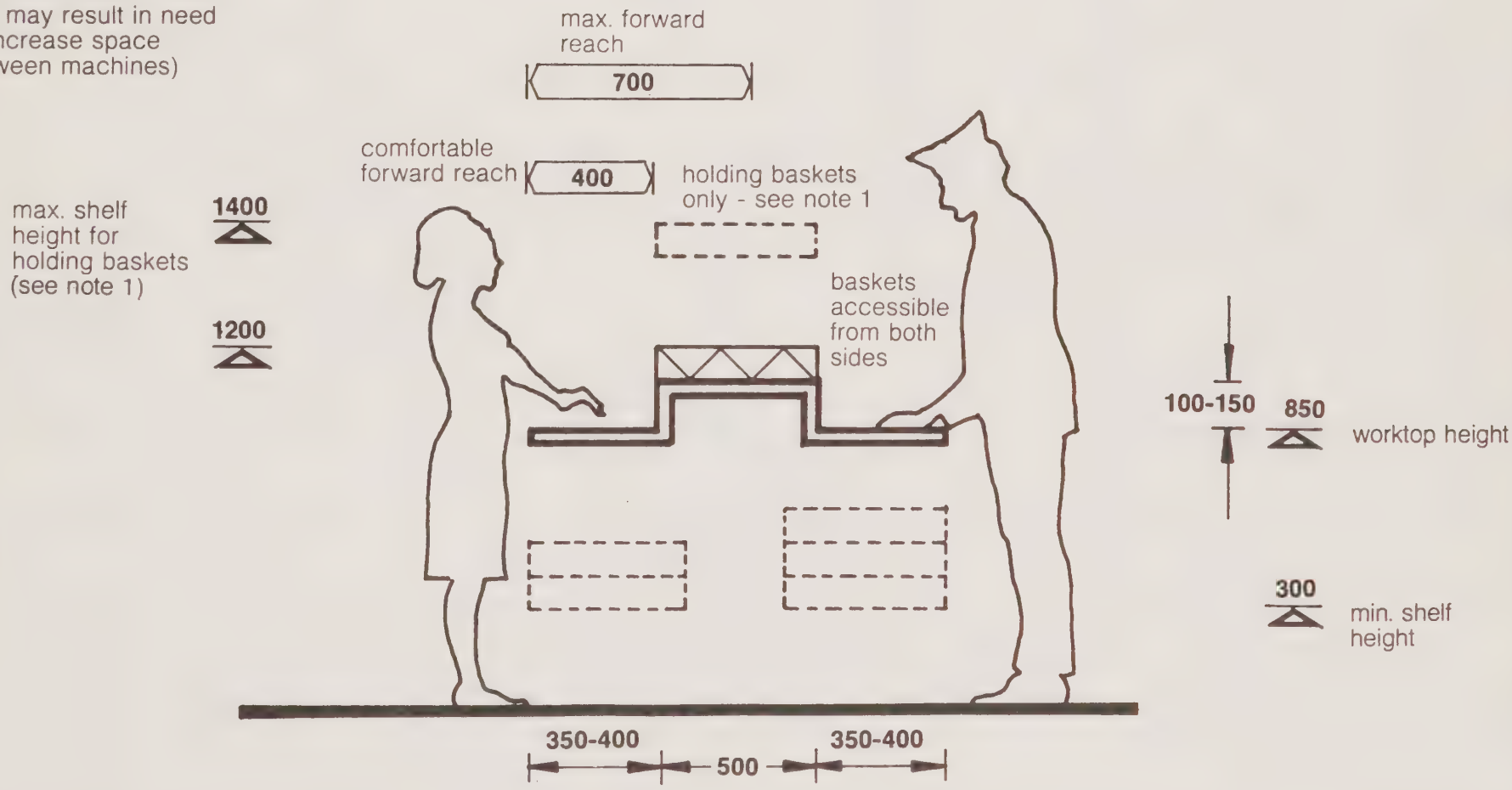
Automatic - Flight type

Users:
Catering staff

SECTION



ALTERNATIVE SECTION
(N.B. extra width of this unit may result in need to increase space between machines)



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

baskets into which individual items of glass or crockery are placed during sortation should not be above 1200 above floor level. Full or empty baskets may however be stored in shelves up to 1400 high. Where basket is angled to improve visibility into basket, basket rim height may be increased to 1400.

Notes:

1. It is recommended that the rim height of

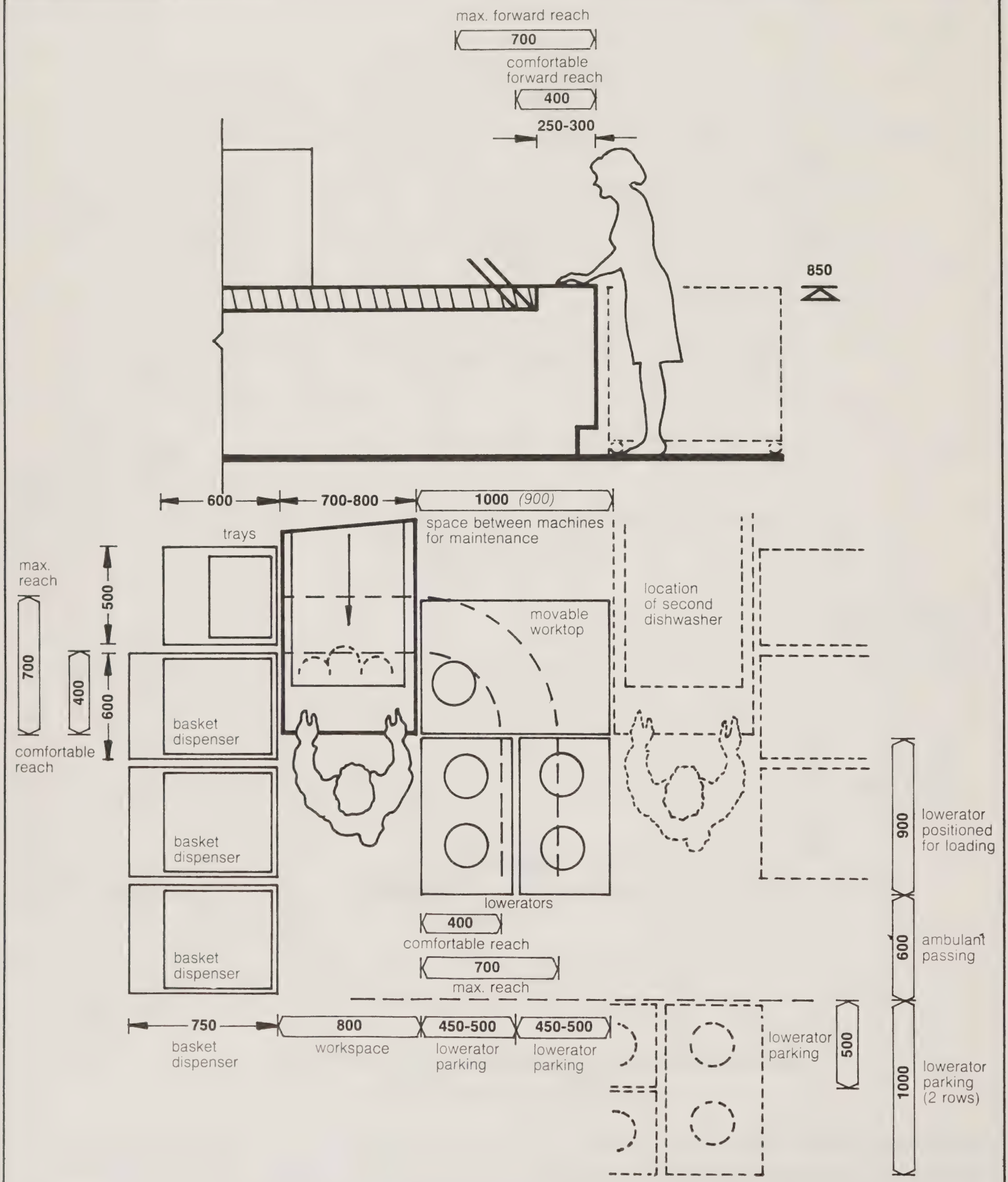
Activities:
Unloading machine, sorting and storing

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Dishwasher (3)

Automatic - Flight type

Users:
Catering staff



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

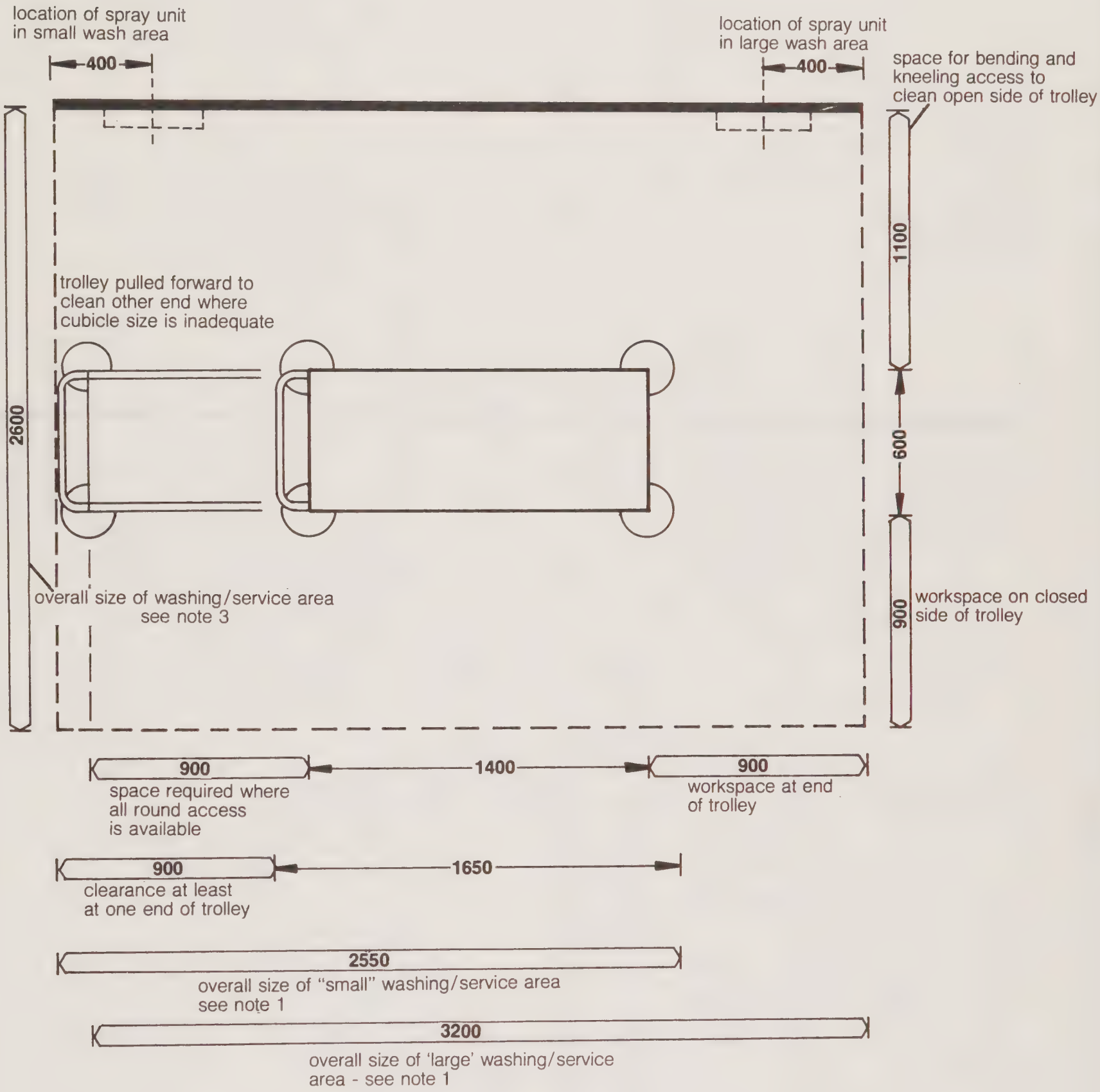
Activities:
Washing and servicing trolley

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Trolley

Food service 30 tray
(also smaller catering trolley)

Users:
Staff


location of spray unit in small wash area
400
location of spray unit in large wash area
400
space for bending and kneeling access to clean open side of trolley
1100
trolley pulled forward to clean other end where cubicle size is inadequate
2600
600
900
overall size of washing/service area see note 3
workspace on closed side of trolley
900
1400
900
space required where all round access is available
workspace at end of trolley
900
1650
clearance at least at one end of trolley
2550
overall size of "small" washing/service area see note 1
3200
overall size of 'large' washing/service area - see note 1

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. All round access for cleaning/servicing is preferred where the cleaning workload is high. The need to move the trolley during washing/cleaning is unsatisfactory.

2. The washing area must be suitably screened from adjacent areas during the use of the spray unit.

3. It is recommended that access be via a full width opening. Turning access can then be achieved from a minimum width (1300) corridor. If the opening is reduced, then a wider corridor will be necessary to manoeuvre into a satisfactory position in the bay.

4. A sink with drainer may be required to wash removable parts of trolley.

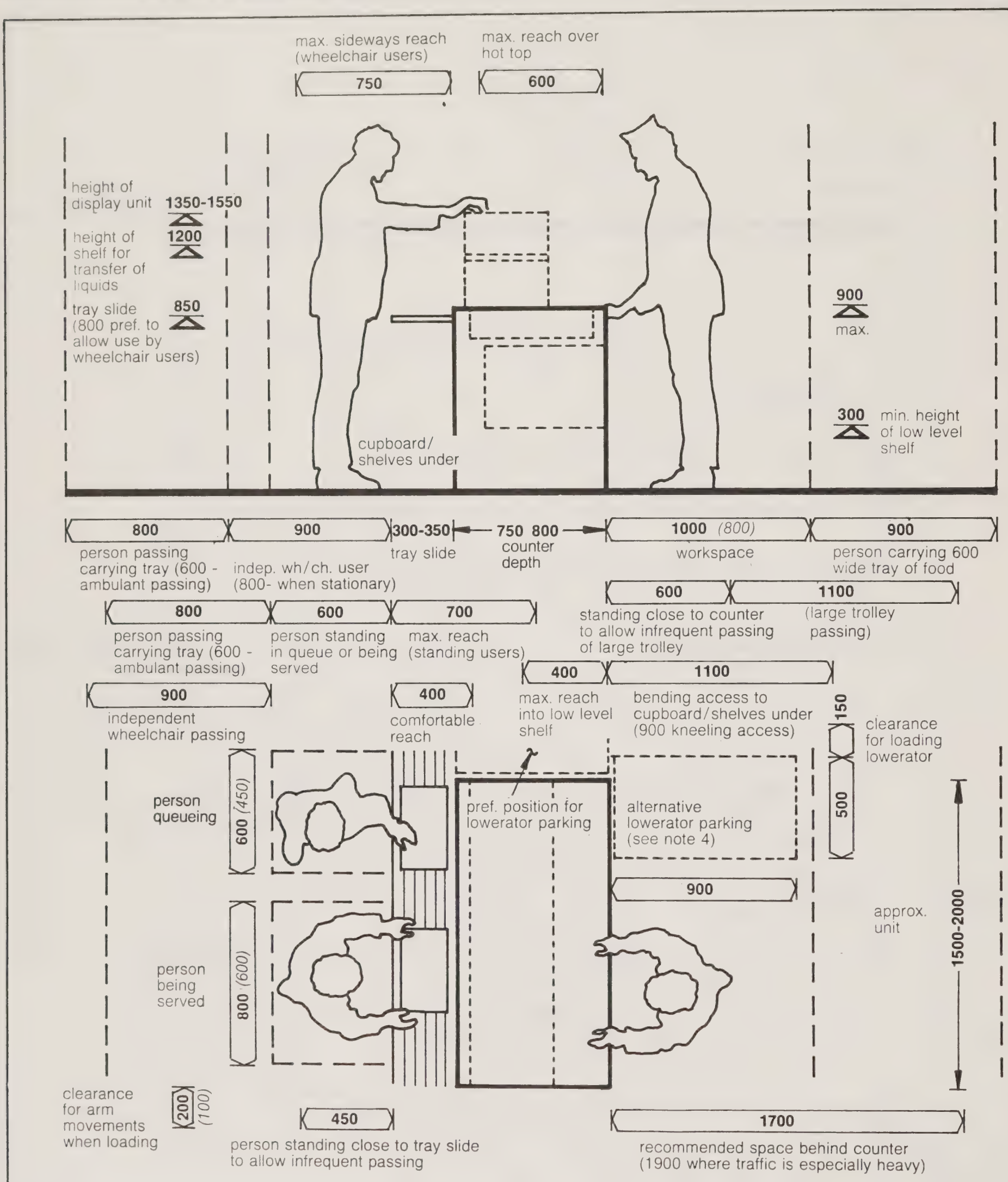
Activities:
Serving of hot and cold food - linear arrangement of counters
(see also Service counter (2) & (3) for angled arrangement)

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Service counter (1)

Hot/cold
Bain marie/Plain top

Users:
Catering staff (serving), staff, visitors and occasional wheelchair users



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Units may have plain or bain marie tops with shelves or display units over, and shelves accessible from the working side only under.

2. Where counters are backed by other equipment e.g. hot cupboards, equipment parking, etc., see relevent data sheet as an increase in space may be required. Space will also depend on the frequency of concurrent use of back to back components and the need to maintain space for circulation.

3. Units may be arranged
(a) linear - resulting in queueing parallel to units as shown.
(b) angled - (see sheet 2)

4. Alternative lowerator parking position shown is not generally recommended as it restricts free circulation behind counter.

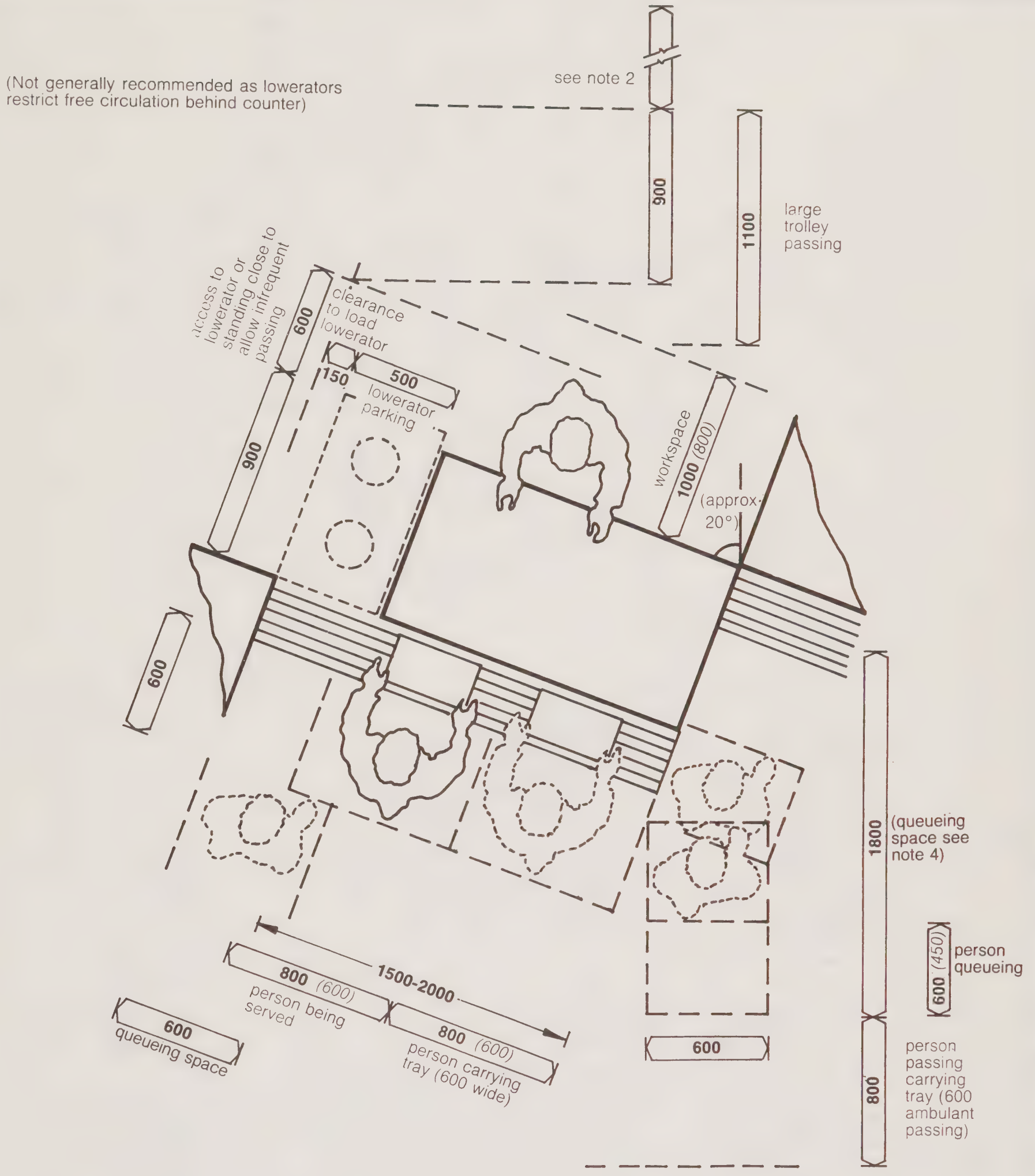
Activities:
Serving hot and cold food (free flow system) (see also Service counter (1) for linear arrangement)
Lowerator parked in bay at end of counter (see also Service counter (3) for alternative arrangements)

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Service counter (2)

Hot/cold
Bain marie/Plain top

Users:
Catering staff (serving), staff, visitors and occasional wheelchair users.



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Units may have plain or bain marie tops with shelves or display units over, and shelves accessible from the working side only under.

2. Where counters are backed by other equipment e.g. hot cupboards, equipment parking, etc., see relevant data sheet as an increase in space may be required. Space will also depend on the frequency of concurrent use of back to back components and the need to maintain space for circulation.

3. The Free Flow arrangement occupies more space than the linear arrangement, but reduces queueing times during peak periods.

4. A queueing length of space of 1800 provides space for 3 persons queueing or 4 persons in a restricted space.

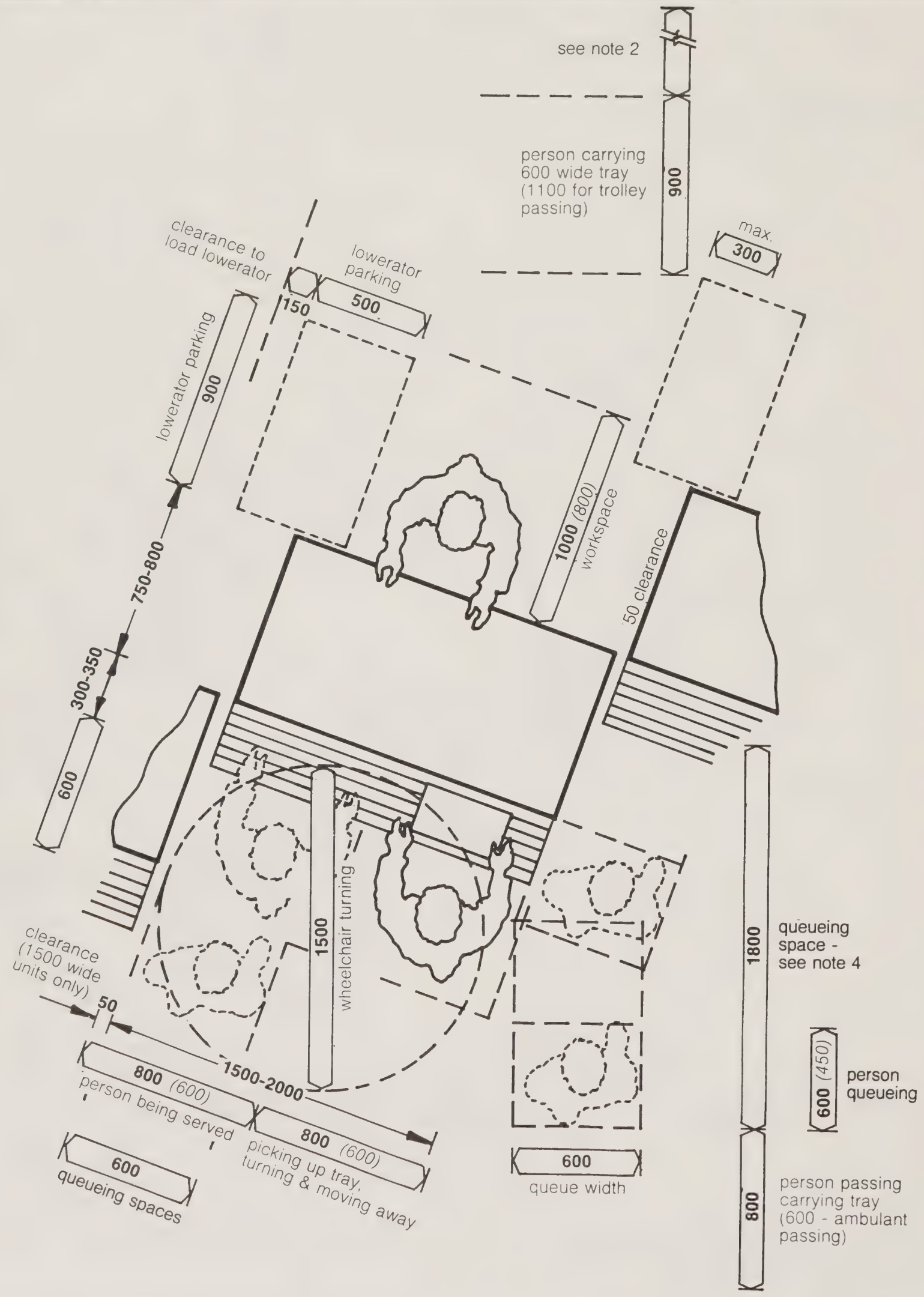
Activities:
Serving hot and cold food (free flow system) (see also Service counter (1) for linear arrangement)
Lowerator parked in bay at end of counter (see also Service counter (2) for alternative arrangements).

DHSS **Ergonomic data bank:**
Component-user data sheet, not to scale

Service counter (3)

Hot/cold
Bain marie/Plain top

Users:
Catering staff (serving), staff, visitors and occasional wheelchair users.



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. Units may have plain or bain marie tops with shelves or display units over, and shelves accessible from the working side only under.

2. Where counters are backed by other equipment e.g. hot cupboards, equipment parking, etc., see relevant data sheet as an increase in space may be required. Space will also depend on the frequency of concurrent use of back to back components and the need to maintain space for circulation.

3. The Free Flow arrangement occupies more space than the linear arrangement, but reduces queueing time during peak periods.

4. A queueing length of space of 1800 provides space for 3 persons queueing or 4 persons in a restricted space.

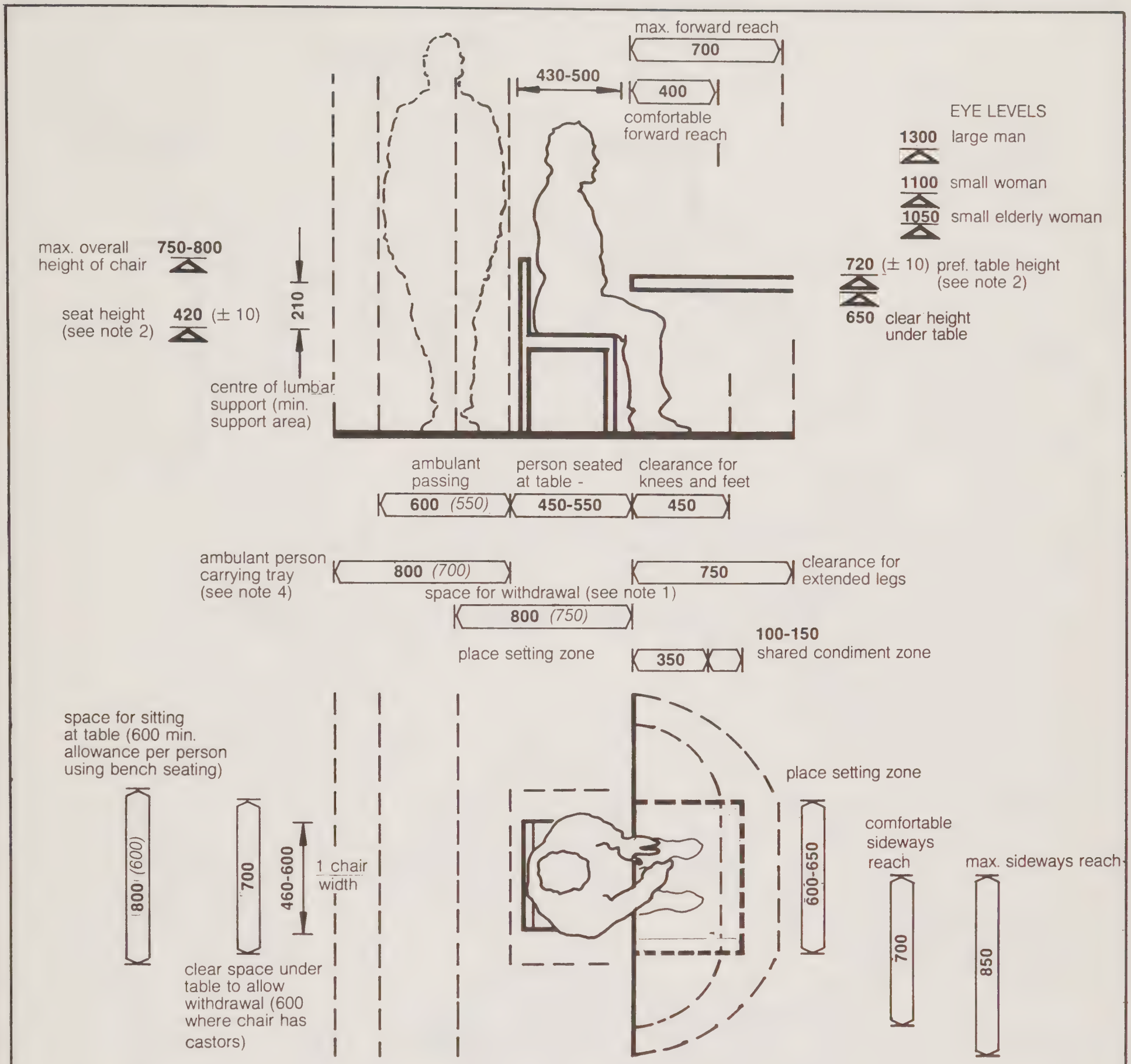
Activities:
Sitting and eating a meal, including user and service access

DHSS **Ergonomic data bank:**
Component data sheet, not to scale

Table & Chair

Upright

Users:
Fully and partially capable adults



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. Space for withdrawal - (750) is acceptable where the obstruction behind the chair is low level - ie 800 or below. Where the chair is upholstered the corresponding dimensions are 900 (800).

2. Alternative higher table and seat heights are possible that will also allow restricted use by wheelchair users, thus avoiding segregation ie 750-770 max. table height and 470 (± 10) chair height (these recommendations are however less satisfactory for smaller users especially female - see also note 5.

3.(a) Maximum angle of seat place 4^0. The seating surface may be flat, sloped or include dishing. Any dishing should not exceed 10mm in depth and occur in the back 2/3 of the seat length, with the deepest part 3/4 length back from front edge.

(b) Angle between seat and backrest planes 95^0 to 100^0 max for dining chairs.

4. Circulation space behind chair 800 circulation is preferred as this also allows access (slightly restricted) by semi-ambulant users.

5. Ergonomic objectives for CHAIR/TABLE combintation

(a) Shod feet should be flat on floor, with no pressure at front or seat between seating surface and thighs.
(b) Front edge of seat must not impose pressure on back of legs - ie seat length must be adequate but not too long.
(c) The clearance between underside of table and seat surface must allow freedom of table and seat surface must allow freedom of movement for thighs.
(d) Ideally the chair/table combination should be such that the users elbows are approximately level with the table top when upper arm is vertical.
(e) The chair should provide firm back support in the lumbar region but below the shoulder blades.
(f) Preferably there should also be adequate clearance between the backrest and seat to allow free movement of the buttocks.

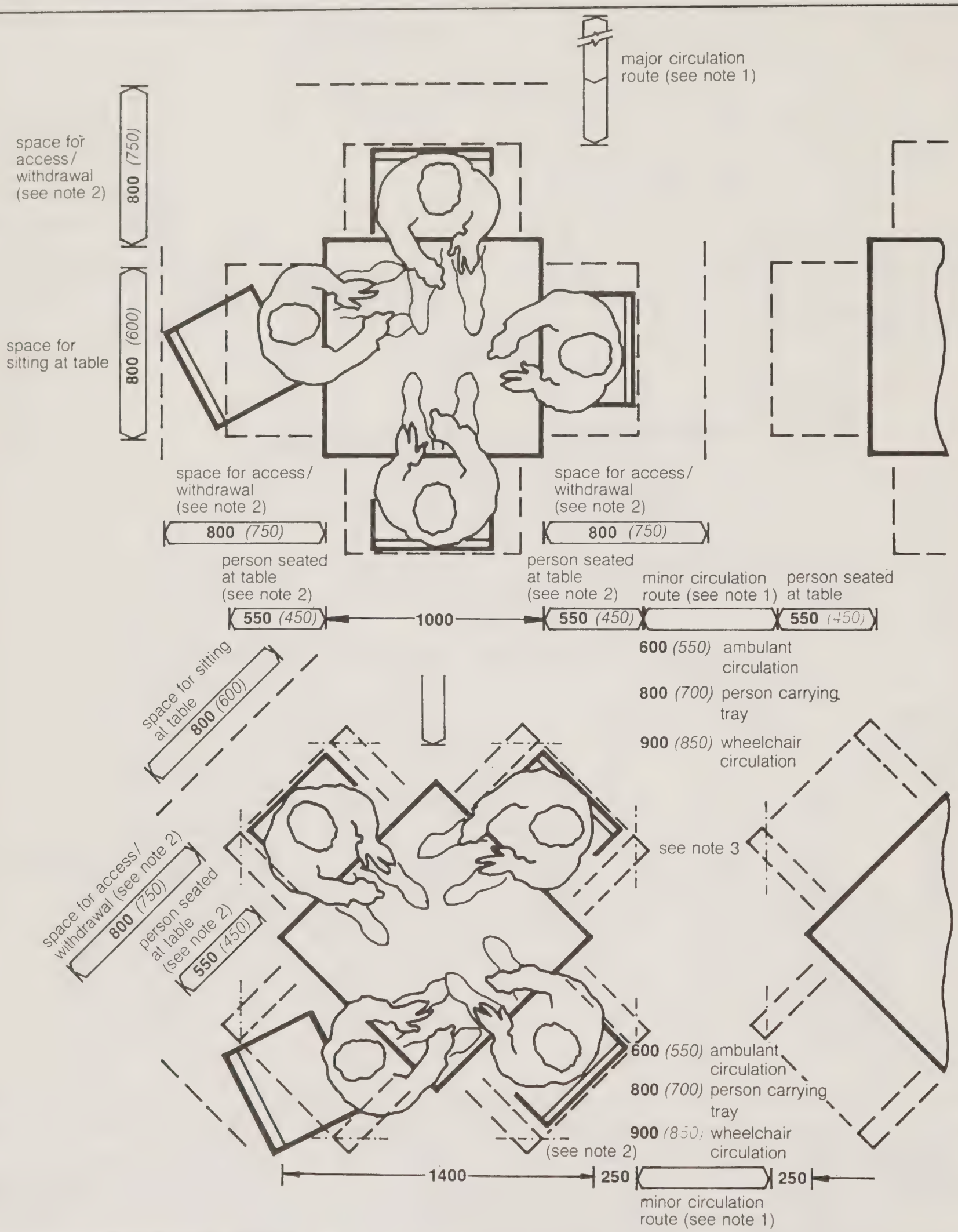
6. Larger place settings 700x400-450 may be desirable for special requirements and users with some physical disabilities.

Activities:
Access to and use of dining tables and chairs (self service and clearing up by catering staff).

DHSS **Ergonomic data bank:**
Component user data sheet, not to scale

Table
Dining (Square)

Users:
Fully & partially capable adults



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. Width of major circulation routes dependent on traffic conditions ie the number and frequency of people ng a route the frequency of passing conditions occuring and need to move equipment (eg width of route allowing frequent passing of 2 people carrying trays = 800 + 800 = 1600. 1600 also allows infrequent passing of wheelchair user and person carrying a tray ie 900 - (1700) etc) Width of minor routes - is dependent on number and frequency of people using the route and the possible need to move equipment. N.B. The drawings above do not allow for circulation between two back to back users withdrawn from table.

2. Where upholstered chairs are used space for person seated at table should be increased from 550 (450) to 600 (500) and space for withdrawal from 800 (750) to 900 (800). Also for angled table arrangement 250 dimension between circulation space and corner of table should be increased to 300 for upholstered chair.

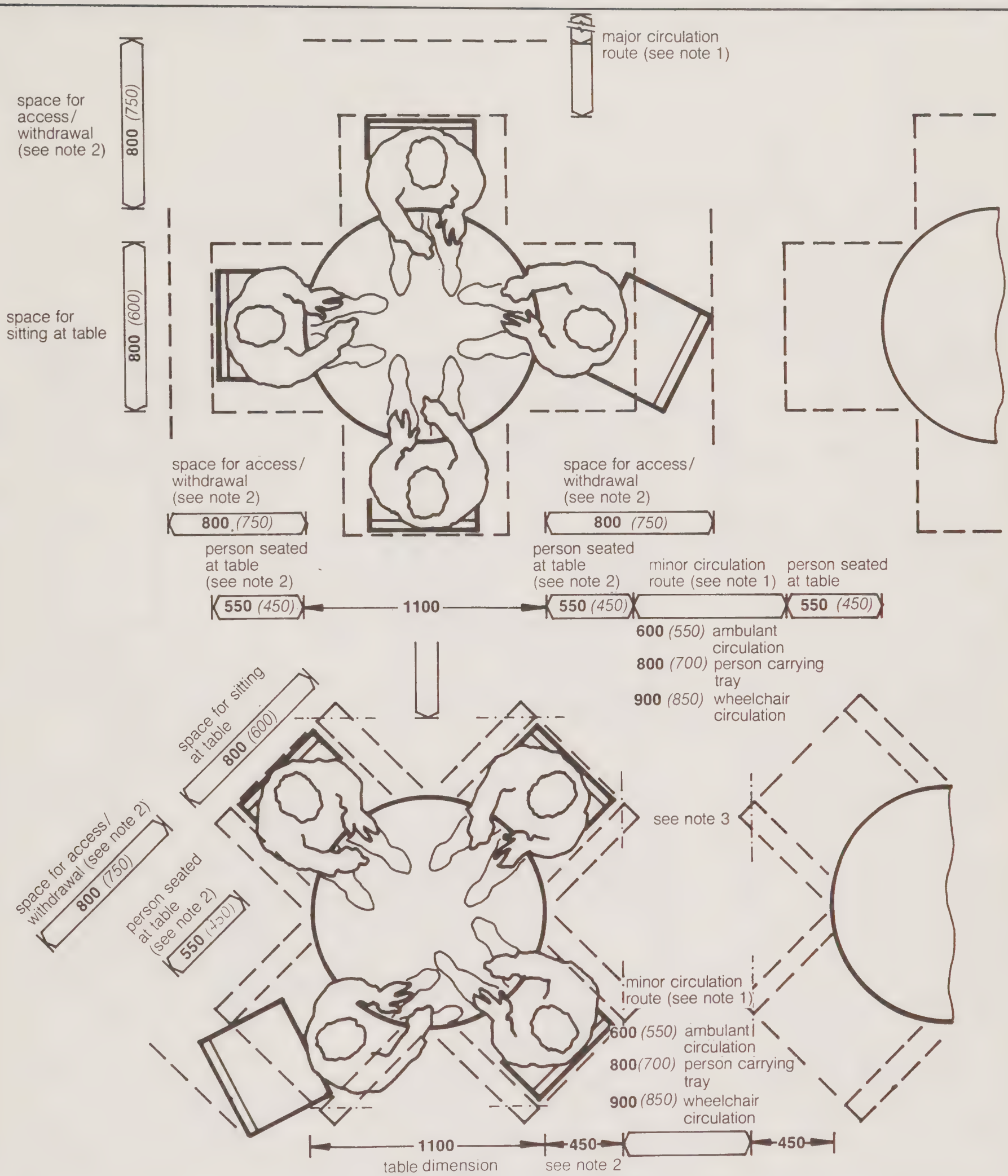
3. As significant arm movements take place forward of chair backrest it is possible to overlap user space for diners and circulation space in the angled table arrangement. It is recommended therefore that the circulation widths relate to the restricted (600) width of space for diners.

Activities:
Access to and use of dining tables and chairs (self service and clearing up by catering staff).

DHSS **Ergonomic data bank:**
Component user data sheet, not to scale

Table
Dining (round)

Users:
Fully & partially capable adults



1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. Width of major circulation routes - dependent on traffic conditions ie the number and frequency of people using a route, the frequency of passing conditions occuring and need to move equipment (eg width of route allowing frequent passing of 2 people carrying trays = 800 + 800 = 1600. 1600 also allows infrequent passing of wheelchair user and person carrying a tray ie 900 - (1700) etc) Width of minor routes - is dependant on number and frequency of people using the route and the possible need to move equipment. N.B. The drawings above do not allow for circulation between two back to back users withdrawn from table.

2. Where upholstered chairs are used space for person seated at table should be increased from 550 (450) to 600 (500) and space for withdrawal from 800 (750) to 900 (800). Also for angled table arrangement 450 dimension between circulation space and corner of table should be increased to 500 for upholstered chair.

3. As significant arm movements take place forward of chair backrest it is possible to overlap user space for diners and circulation space in the angled table arrangement. It is recommended therefore that the circulation widths relate to the restricted (600) width of space for diners.

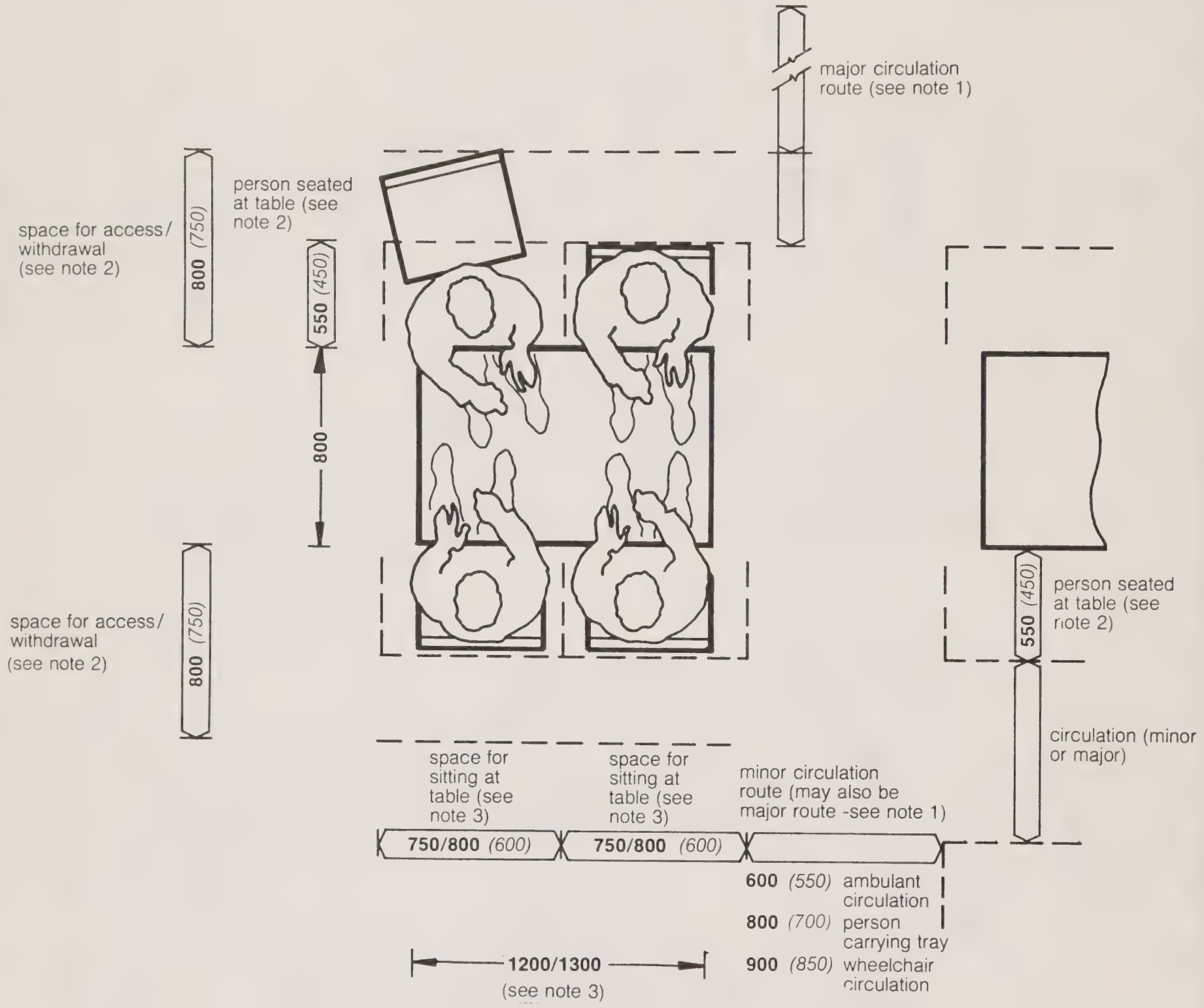
Activities:
Access to and use of dining tables and chairs
(self service and clearing by catering staff)

DHSS **Ergonomic data bank:**
Component user data sheet, not to scale

Table

Dining (rectangular)

Users:
Fully and partially capable adults


major circulation route (see note 1)
person seated at table (see note 2)
space for access/ withdrawal (see note 2)
800 (750)
550 (450)
800
800 (750)
space for access/ withdrawal (see note 2)
550 (450)
person seated at table (see note 2)
circulation (minor or major)
space for sitting at table (see note 3)
space for sitting at table (see note 3)
minor circulation route (may also be major route -see note 1)
750/800 (600)
750/800 (600)
600 (550) ambulant circulation
800 (700) person carrying tray
900 (850) wheelchair circulation
1200/1300
(see note 3)

1350 *(1300)*

Preferred minimum: *Restricted minimum (not recommended for general use: see explanatory notes)*

1. Width of major circulation routes - dependent on traffic conditions ie the number and frequency of people using a route, the frequency of passing conditions occuring and need to move equipment (eg width of route allowing frequent passing of 3 people carrying trays = 800 + 800 = 1600. 1600 also allows infrequent passing of wheelchair user and person carrying a tray (eg 900 (700) etc) Width of minor routes - is dependent on number and frequency of people using the route and the possible need to move equipment. N.B. The drawings above do not allow for circulation between two back to back users withdrawn from table.

2. Where upholstered chairs are used space for person seated at table should be increased from 550 (450) to 600 (650) and space for withdrawal from 800 (750) to 900 (800).

3. A reduction in width of space for person sitting at table from 800 to 750 is acceptable with a 1200 width table. The restricted dimension (600) is applicable where passing in infrequent. The larger table length of 1300 is preferred for debilitated or disabled users. The table width of 900 is more satisfactory where wheelchair users have to be occasionally accommodated.

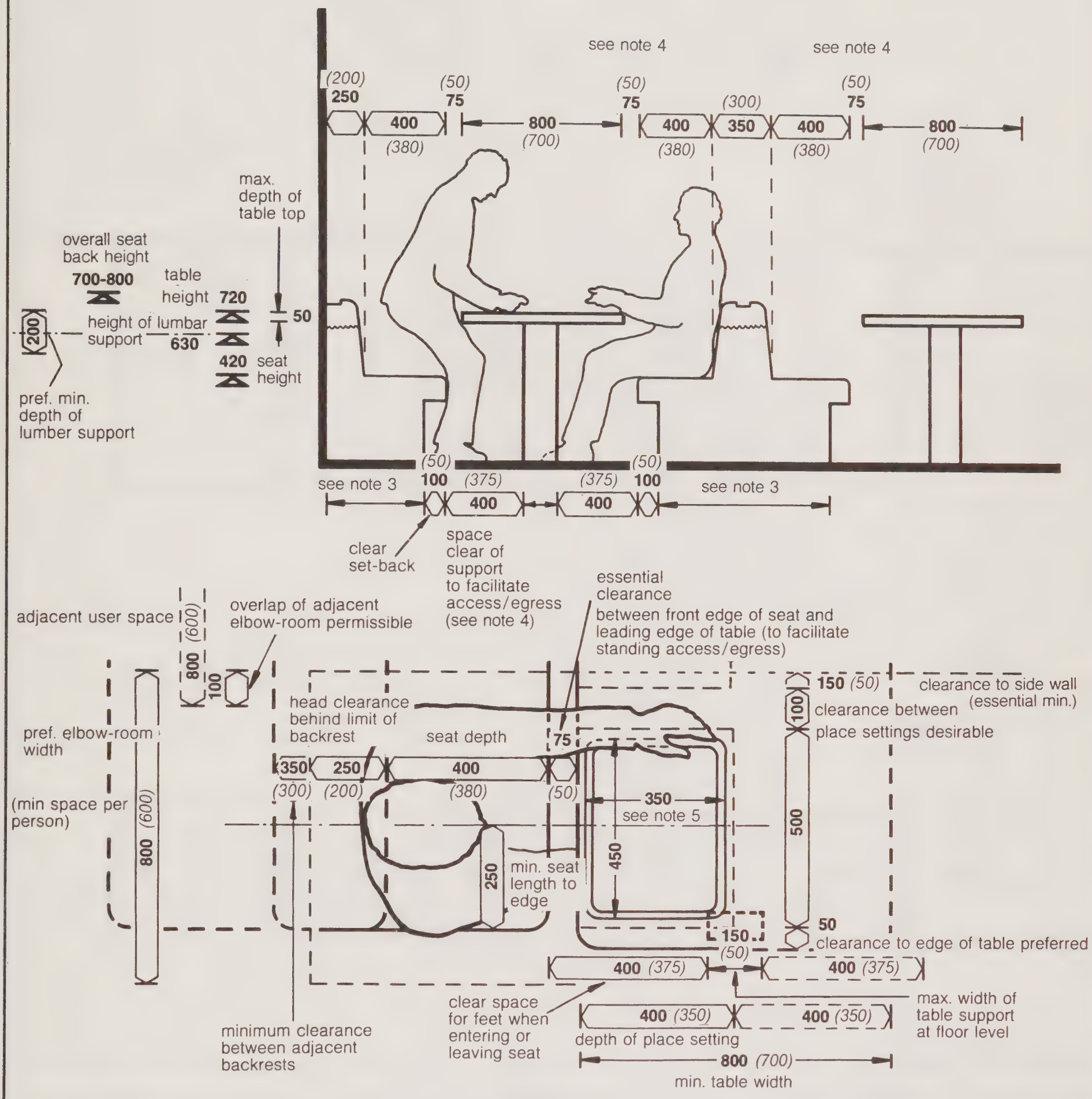
Activities:
Access to and use of dining tables, involving self-service main meal facilities, and including clearing up and cleaning by catering staff.

DHSS **Ergonomic data Bank**
Component user data sheet, not to scale

Banquette Seating (1)

for Staff Dining

Users:
Fully capable adults



PLAN OF INDIVIDUAL SPACE REQUIREMENTS

1350 *(1300)*

Preferred minimum: *Restricted minimum not recommended for general use: see explanatory notes)*

Notes:

1. See also BANQUETTE SEATING (2) for 4 and 6 place table dimensions, layout, and circulation space requirements.

2. Inner seat positions, particularly in six place banquette tables, are difficult to access - 2 or 4 place table are therefore generally preferred.

3. To avoid cleaning difficulties, it is recommended that all fixed seat bases should be blocked in.

4. Min. gap can be reduced below 50 but access and egress will be difficult, and must incorporate bench type seats which allow users to slide seated into internal seat positions.

5. When table width is only 700, trays must specifically be designed to overlap front edge of table.

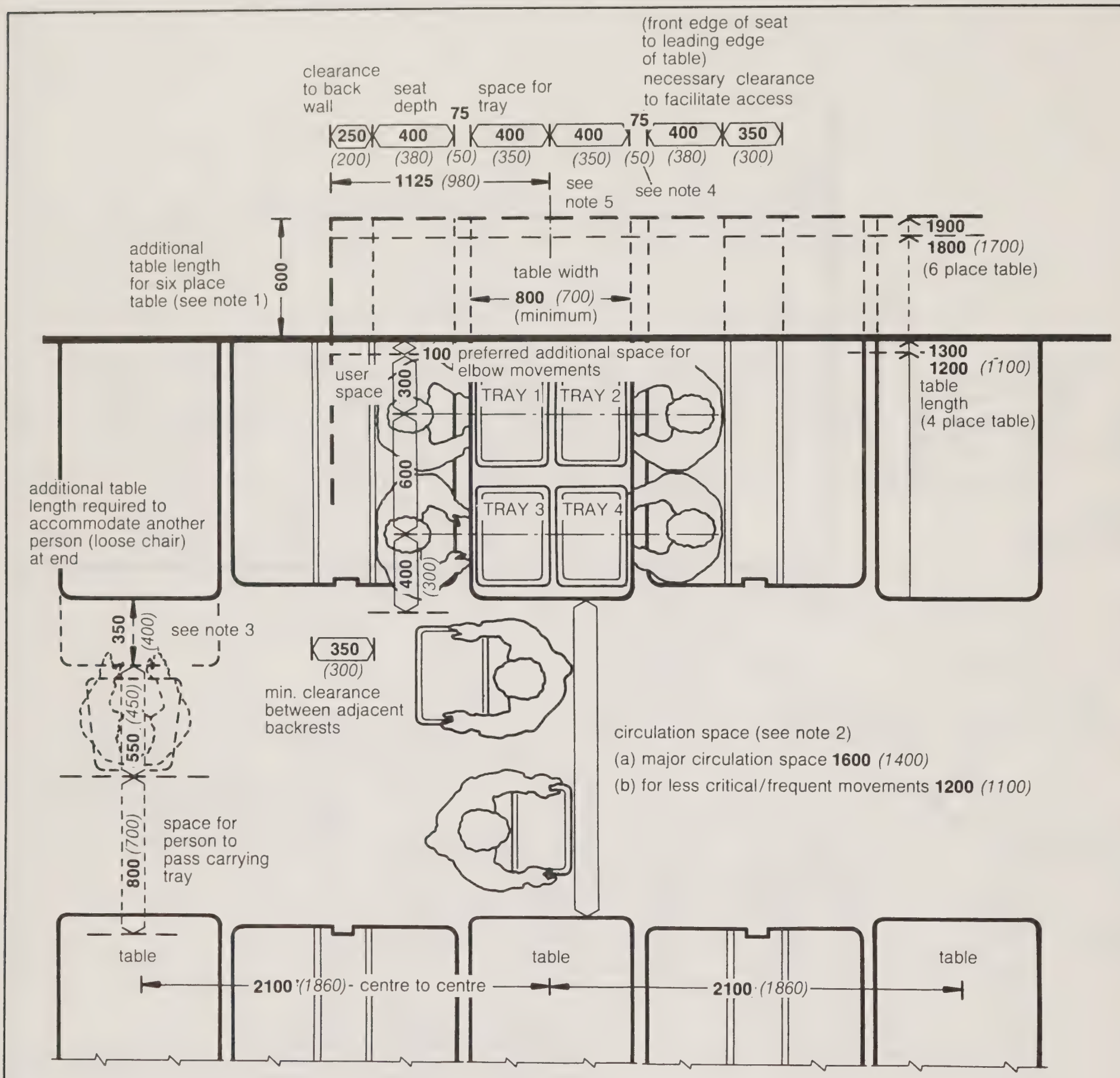
Activities:
Access to and use of dining tables involving self-service main meal facilities, and including clearing up and cleaning by catering staff

DHSS **Ergonomic data Bank**
Component user data sheet, not to scale

Banquette Seating (2)

for Staff Dining

Users:
Fully capable adults.



1350 *(1300)*

Preferred minimum: *Restricted minimum not recommended for general use: see explanatory notes)*

Notes:

1. The two inner seat positions in six place banquette tables are difficult to access. The larger tables are therefore not generally recommended.

2. The width of circulation space required is dependant upon the traffic conditions of the particular route. Frequent passing of 2 people carrying hot or liquid foods requires 800 + 800 = 1600. In cul-de-sac situations however it may be satisfactory for one person to stand close to a table (400) - holding tray over table where necessary - to allow the other person carrying a tray (800) to pass (400 + 800 = 1200). Restricted movement by a person carrying a tray can be achieved in 700, but in the interests of safety this is not recommended for general use in busy areas or on difficult routes.

3. This may be appropriate to provide additional accommodation at the end of cul-de-sacs, but should be avoided in critical positions on major traffic routes.

4. Min. gap can be reduced below 50 but access and egress will be difficult, and must incorporate bench type seats which allow users to slide seated into internal seat positions.

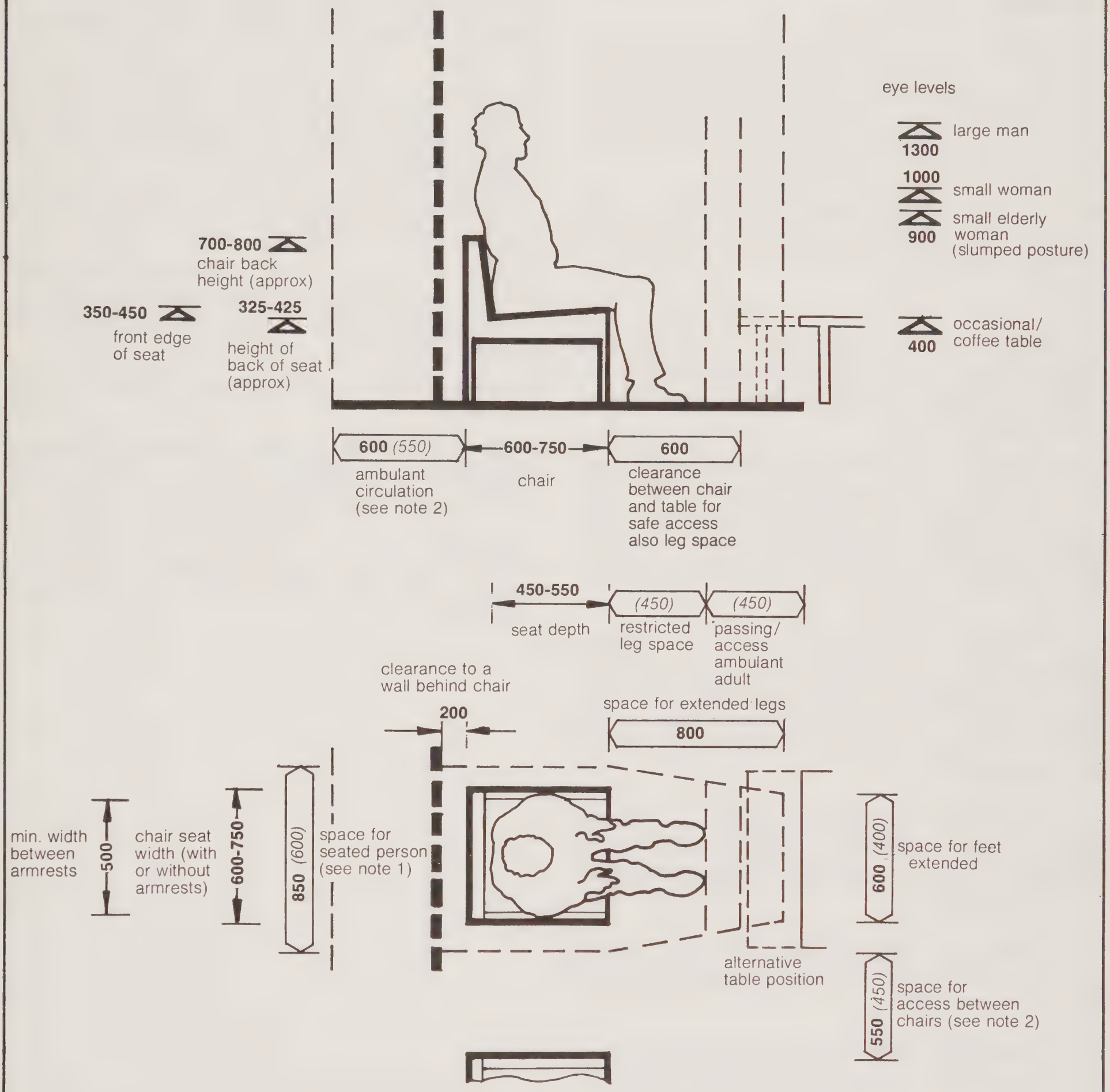
5. When table width is only 700, trays must specifically be designed to overlap front edge of table.

Activities
Sitting, relaxing, drinking coffee, reading informal discussion etc.

DHSS **Ergonomic data bank:**
Componentn-user data sheet, not to scale

Chair
Semi-easy, lowback with or without arms

Users
Adults — staff



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use; see explanatory notes)*

Notes

1. When seats are pushed close together to form rows the average user space dimensions of 750 for seats with arms and 650 for seats without arms should be used.

2. 800 is the minimum dimension to accommodate circulation by patients using sticks or other walking aids.

Appendix 2

Glossary

BAIN-MARIE Originally a shallow bath of heated water mounted on a stand in which to place containers or pans of food to keep them hot. Now includes the cafeteria type of hot counter with fitted containers. Heated by either steam, gas or electricity and now not necessarily wet, as some use hot air or electric elements.

BOILING TOP or TABLE Boiling rings are usually part of the oven range, but separate boiling tables with open or solid tops are also used mounted on stands to match the ranges.

BRATT-PAN This item is also known as a shallow fryer. It is a heavy rectangular pan either gas or electrically heated mounted on a pedestal at working height. It may be fixed or be tilting. It is used for shallow frying, braising and boiling foods.

DISHWASHER RACK TYPE A horizontal conveyor belt runs through the machines pulling racks of crockery, cutlery etc. A different rack is used for the various items being washed. The racks are loaded and unloaded manually so some pre-sorting is required to make optimum use of racks.

DISHWASHER CONVEYOR or FLIGHT TYPE Originally designed to cope with airlines washing-up problems, this also has a conveyor belt running through the machine but it is so designed that plates, cups etc may loaded directly on to the belt. The machine is manually loaded at one end and unloaded at the other.

DOLLY A platform designed to take stacks of identical baskets or trays, fitted with four castors to enable them to be wheeled anywhere. Can also be made to take large mixing machine bowls.

DOLE PLATE A refrigerated plate fitted in the well of a cold service counter, on which may be placed dishes of food to be kept chilled.

DOUGH DIVIDER A machine designed to divide a lump of raw dough into equal size pieces to form rolls etc.

LIQUIDISER A machine that reduces any food to a puree or liquid, powered by an electric motor driving cutter blades, fitted in a glass or metal container.

MOBILE WORK-TOP It is wheeled to a work location, for example next to a fryer to enable the operator to stand container of fish or batter, so prevent walking to and fro. The wheels can be locked whilst in use.

PROVING OVEN A warming cabinet for yeast goods to enable them to rise in the humid atmosphere produced in this oven.

SALAMANDER Often mistaken for a grill where the heat source is below the bars used to hold the food to be cooked. The salamander has the heat source above the food on the bars.

SERVERY The space/area from which food is served. It should be part of the kitchen.

SERVICE SPINE An enclosed structure with power sources on either side to plug in heavy duty items of equipment. Can be stainless steel clad. Forms the centre of an island of equipment.

STRIPPING Scraping plates before placing in the dishwasher.

SNEEZE PLATE A glass screen placed at an angle along the front of the servery counter to protect the food on display from coughs and sneezes.

TRAY SLIDE A shelf mounted on the front of the cafeteria counter to take the diners' trays and enable them to be pushed along the length of the counter to the cashier at the end.

APPENDIX 3

Method of estimating seating provision in dining rooms and coffee lounges

The number of seats required in staff dining rooms and coffee lounges, will depend upon the total number of staff present in the hospital at peak times (ie lunch time), the proportion of those staff who will actually use these facilities, on the average time spent eating, on the opening hours of these facilities and finally on seat utilisation assumptions over this period.

The approach outlined here is a step by step method for estimating seat provision in dining rooms and coffee lounges (and thus for estimating the size of kitchens necessary to provide this service in addition to patient meals).

A brief explanation of the method is shown in Figure 1, with a worked example in Figure 2 and an indication of the sensitivity of this provision to variations in the assumptions on which it is based in Figure 3.

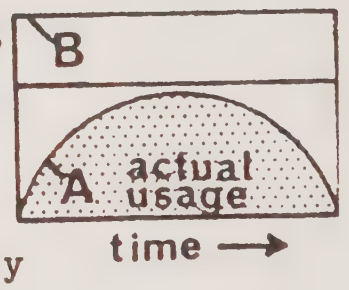
Figure 1

METHOD OF ESTIMATING SEATING PROVISION IN DINING ROOMS AND COFFEE LOUNGES

STEPS	EXPLANATION
WORKLOAD	o Estimate the total staff (FT and PT)
1 Estimate total no. of staff in each category who will be present in hospital at lunchtime	o Exclude estimates of all staff on night duty, late shifts, etc. o This will give an estimate of total potential users of staff catering facilities
2 Estimate proportion of potential users who will use staff catering facilities at lunch time	o Estimate proportion of potential users who will use facilities inside or outside the hospital, go home for lunch etc. (This might require a survey of the use of existing catering facilities eg snack bars, PGMC, staff association and off site facilities). o This will give an estimate of actual users of staff catering facilities.
UTILISATION	
3 Decide on lunch time opening hours	o Usually about 2 hours but may vary to suit local circumstances.
4 Decide if separate coffee lounge is to be provided	o This will affect time spent by staff in the dining room.
5 Estimate average time spent in dining room	o May vary according to type of service provided but 20 minutes is probably a reasonable estimate.
6 Estimate average utilisation of each seat over the lunch period	o Average seat utilisation will be affected by the maximum occupancy of the dining room at peak times (See Figure 3). There will be some underuse of seats because of the build up, and fall off in numbers of staff present at either end of the lunch period. For a given number of staff, seat utilisation will also be affected by the length of the lunch period.
7 Calculate no of seats required in dining room	o No of seats = $\frac{\text{Actual users x average eating time}}{\text{length of lunch period} \times \text{seat utilisation}}$
8 Calculate no of seats required in coffee lounge	o No of seats = $\frac{\text{Proportion of diners taking coffee x average drinking time}}{\text{length of lunch period} \times \text{seat utilisation}}$
9 Examine effect on seat provision of altering assumptions (See Figure 3)	

WORKED EXAMPLE

STEPS	EXPLANATION
WORKLOAD	
1 Estimate no of staff in each category who will be present in hospital at lunchtime	o Total FT and PT staff = 1300 (approx 500 beds) o Estimate % of staff in hospital at lunchtime = 75% assumed o Total potential users = 0.75 x 1300 = 975
2 Estimate proportion of potential users who will use staff catering facilities at lunch time	o Estimate % of potential users who will use staff catering facilities each day = 50% assumed. o Total actual users = 0.5 x 975 = 488
UTILISATION	
3 Decide on lunchtime opening hours	o 2 hours 12-2 pm
4 Decide if separate coffee lounge is to be provided	o Separate coffee lounge
5 Estimate average time spent in dining room	o Assume 20 minutes spent in dining room and 15 minutes in coffee lounge
6 Estimate average utilisation of each seat over lunch period	o Average seat utilisation = area under curve A / area of rectangle B = Approximately 50%+ (equivalent to maximum occupancy at peak times of 80%)
7 Calculate no of seats required in dining room	o No of dining room seats = $\frac{*488 \times 20}{120 \times 0.5}$ = 163 seats

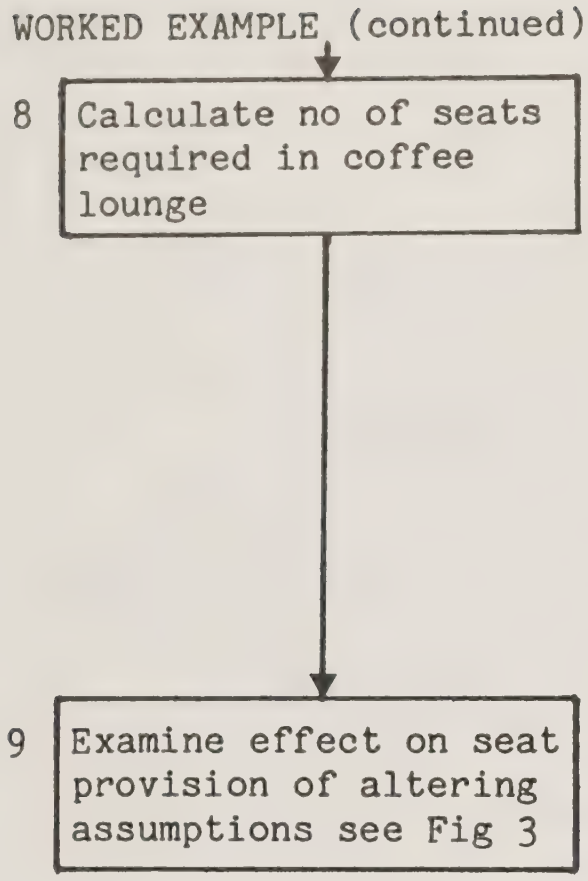


continued

*Assumes all dining room users are coffee lounge users

Figure 2

WORKED EXAMPLE (continued)



proportion of diners = 488 x *50% = 244
who will take coffee

proportion of staff = 975 x *30% = 325
taking coffee only

Total actual users = 569
of coffee lounge

o No of coffee lounge seats = $\frac{569 \times 15}{120 \times 0.5}$ = 142 seats

*Assumes 50% of diners take coffee and 30% of total staff take coffee only.

Appendix 3

Figure 3

EFFECT ON SEAT PROVISION OF ALTERING WORKLOAD AND UTILISATION ASSUMPTIONS

WORKLOAD CHANGE	EFFECT
o Higher % staff present at lunchtime	o Proportionate increase in seat provision
o Higher % of potential users actually using staff catering facilities	o Proportionate increase in seat provision
UTILISATION	
o Alter length of lunch period and keep seat utilisation constant	
2 hour lunch period. Approx 50% seat utilisation	o 163 seats (baseline calculation)
1¾ hour " " " 50% " "	o 186 seats
1½ hour " " " 50% " "	o 217 seats
o Alter utilisation assumptions	
70% max occupancy = Approx 45% seat utilisation	o 181 seats
80% " " = " 50% " "	o 163 seats (baseline calculations)
90% " " = " 55% " "	o 148 seats
100% " " = " 60% " "	o 136 seats
o Alter average time spent eating	
25 minutes	o 203 seats
20 "	o 163 seats (baseline calculations)
15 "	o 122 seats

continued

Figure 3

EFFECT ON SEAT PROVISION OF ALTERING WORKLOAD AND UTILISATION ASSUMPTIONS (continued)

o Alter average time spent in coffee lounge	
25 minutes	o 237 seats
20 "	o 189 seats
15 "	o 142 seats
o Alter proportion of diners who will take coffee	
25%	o 112 seats
35%	o 124 seats
50%	o 142 seats

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